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AMERICAN
GAS JOURNAL
Established 1859 Pioneer of the Gas Industry
Manufactured and Natural Gas

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Unvarying Delivery Pressure

Upper View—Actual furnace installation, spring type. *Lower View*—Cross section of spring type. Also built in dead weight, screw top and solid top.

It is absolutely essential to have unvarying delivery pressure for combustion purposes. Reynolds Low Pressure Regulators give you this regardless of uneven volumes and inconsistent line pressures.

These Low Pressure Regulators are built to handle specific jobs. They are precision-built units delicately balanced for accurate delivery of required volume. The factory test through a maximum range of operating conditions is Reynolds Guarantee. The thousands now giving satisfactory performance is silent testimony of a good product.

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REYNOLDS GAS REGULATOR COMPANY

ANDERSON, INDIANA, U.S.A.

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12 miles of cast iron pipe with
MECHANICAL JOINTS
for a high pressure gas line

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Specifications called for 6-inch cast iron pipe with *mechanical joints*, subject to 400-pound pressure field test. The joints used are based on the "stuffing-box" principle employing rubber gaskets with follower rings.

The "stuffing-box" principle is embodied in several mechanical joints made by members of The Cast Iron Pipe Research Association. Tests and installations have demonstrated that these joints are *gas-tight* under high pressures.

For further information write to The Cast Iron Pipe Research Association, Thomas F. Wolfe, Research Engineer, 309 Peoples Gas Building, Chicago, Ill.

CAST Q IRON

Look for the "Q-check" symbol as shown above. It is the registered trademark of The Cast Iron Pipe Research Association.

CAST IRON PIPE

AMERICAN
GAS JOURNAL
Established 1859 *Pioneer of the Gas Industry*

Manufactured and Natural Gas

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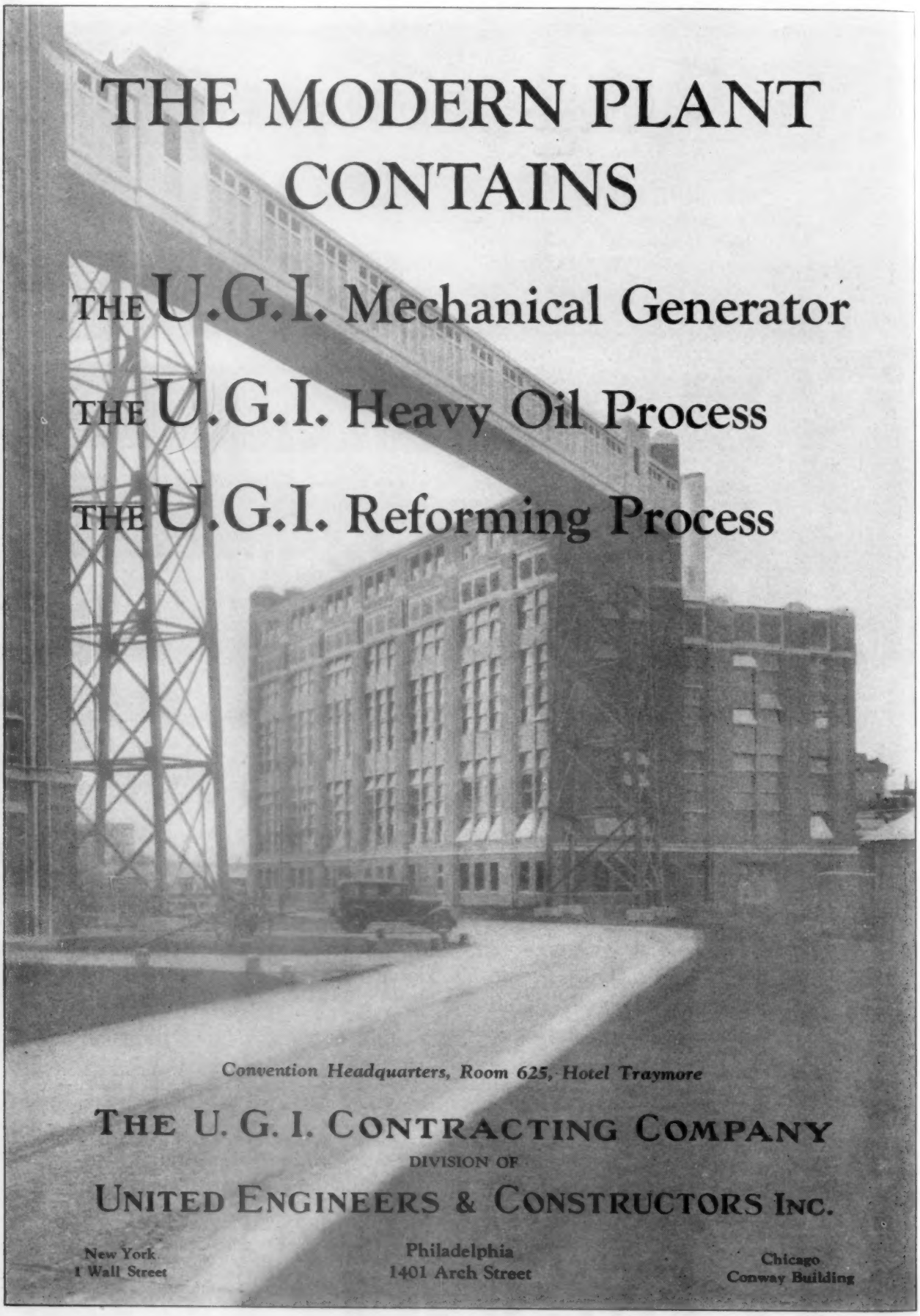
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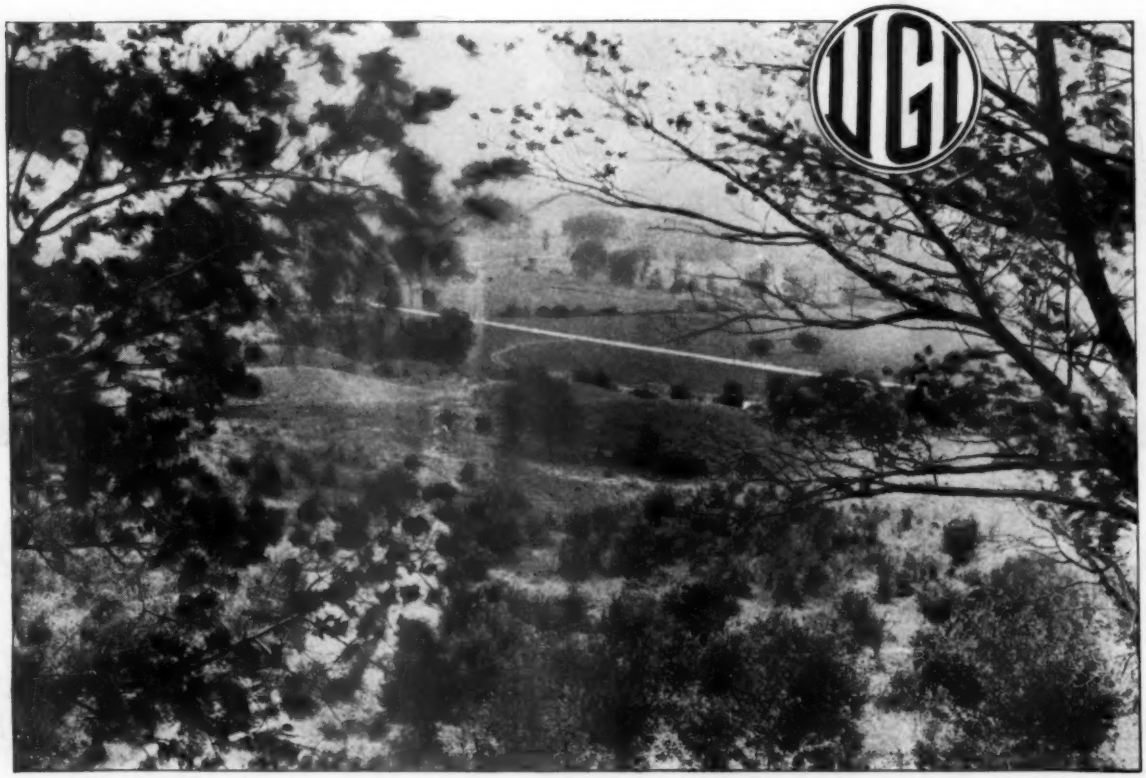

Bringing Natural Gas into Syracuse

This 18" Natural Gas line from Onandaga to the Hiawatha Avenue Plant of Syracuse Lighting Co. involved all types of construction from cross-country work to highways through thickly populated sections.

It was built within scheduled time and with an important saving to the client.

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MAXIMUM RETURN TO CLIENTS PER DOLLAR INVESTED

ASTONI

A NEW HEATER *and a*
NEW SELLING PLAN *which*
will Unquestionably Produce
Sales of from 10 to 15 Per
Cent of Any Gas Company's
Meters During the First Year.
Don't Fail to read this An-
nouncement! Send for Details.

SHING!

WE have designed and perfected a new automatic Water Heater with the idea of offering this heater to the Utilities under a plan that will enable them to GIVE this heater away or to put it out on a rental plan at such a low unit price to pay for the heater during the first year from the increased revenue from the gas consumed.

We have worked out four complete methods of placing these heaters on the lines. These four plans should be the means of securing immediate saturation of all the meters on the lines of any Utility taking up this proposition.

With this plan the consumer is bound to be satisfied and immediately install a Water Heater. A few installations in any community will be all that is required to sell the idea to the public, and once this is accomplished, a tremendous new field is opened to the use of Gas.

THE PLAN

Briefly, the four methods are as follows:

PLAN NO. I
A WATER HEATER AT NO CHARGE TO THE CONSUMER

PLAN NO. II
RENTAL PLAN

PLAN NO. III
OUTRIGHT SALES PLAN

PLAN NO. IV
THE PITTSBURG WATER HEATER COMPANY WILL HANDLE THE ENTIRE TRANSACTION

Details of the plans cannot be given here because of lack of space, but complete information will be gladly sent you on request.

THE HEATER

The heater offered is absolutely dependable and efficient in every way and is backed by the reputation of this Company.

FINANCING

To finance an enterprise of this size, we have worked out a sound Finance Plan which should enable any Public Utility to embark on this project.

YOUR PROFITS

We have carefully estimated the amount of profits any gas company—manufactured or natural—can expect to make out of this plan during the first year and thereafter. We will be glad to send you complete figures.

ACT NOW!

Now you can build business in spite of the depression and with an absolute minimum of cash outlay.
All you need to do is cooperate in this large-volume cycle of sales from Maker to User.
Get in touch with Pittsburg now and lay your plans for immediate sales.

PITTSBURG WATER HEATER CO.

Hartley Walker
President

U.G.I., *in its fifty-first year of service to the gas industry, extends greetings to the members of the American Gas Association.*

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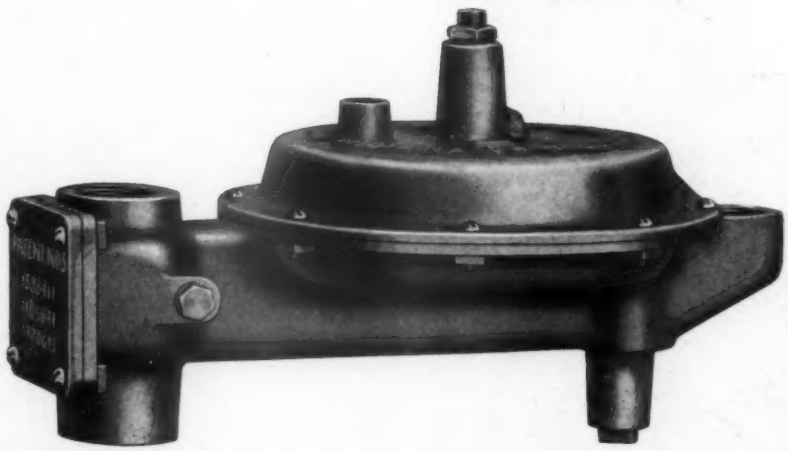
GAS REGULATOR CO.



GROBLE SERVICE REGULATOR WITH MERCURY SEAL SPRING TYPE—STYLE 50, AND 9 OTHER STYLES

THINK OF THIS

Two of the largest gas companies in the United States, who are large users of service regulators, have had in use for over five years 16,000 Groble No. 1 Service Regulators, and have spent less than ½ of 1% of the purchase price for repairs. Does not this fact alone deserve your careful consideration?

Groble Regulators cut your complaint calls in half. When necessary to service, Groble Regulators are 100% accessible while in the line.

Think of it, a regulator that is PERFECTLY BALANCED, which gives greater capacity, minimum lock-up pressure, and minimum drop in pressure. All working parts are 100% rust-proof. The material and workmanship are absolutely guaranteed.

WHEN YOU BUY A GROBLE REGULATOR, YOU BUY THE BEST AT THE PRICE OF ORDINARY REGULATORS.

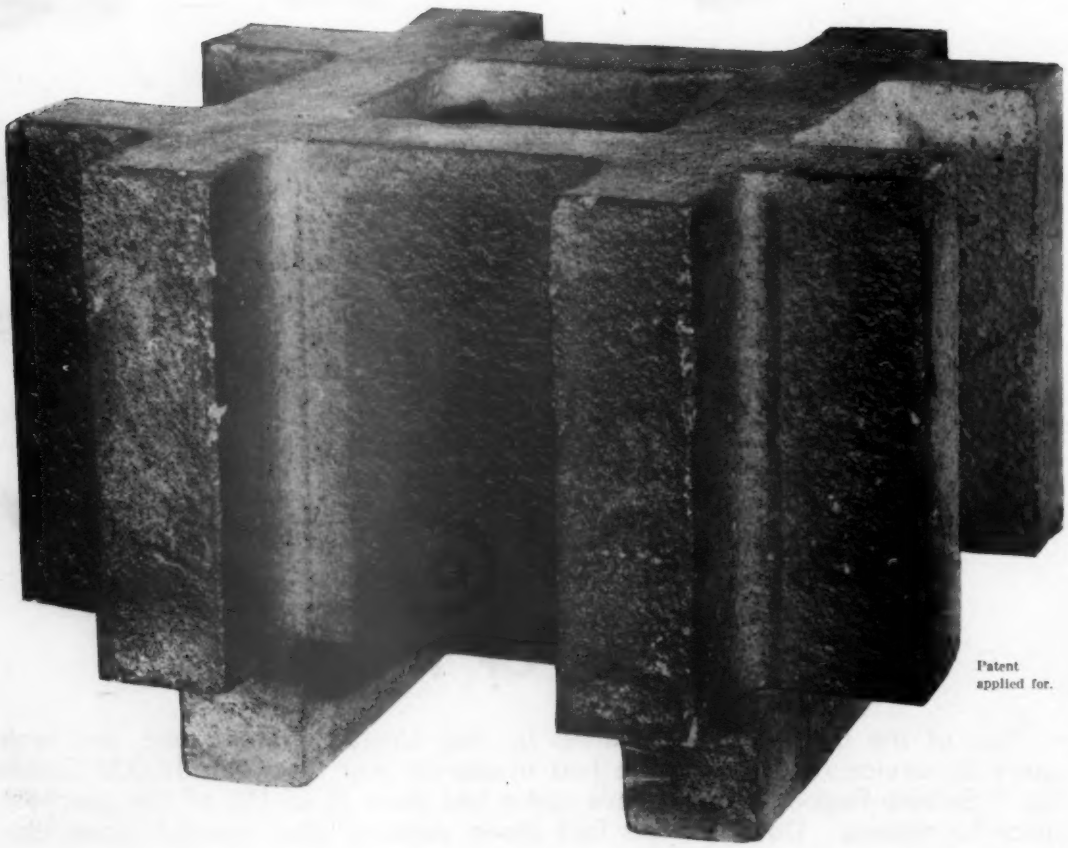
Groble also makes a complete line of large regulators. Send for Catalogue No. 6.

Send to-day for Groble No. 5 Catalogue on service regulators.

GROBLE GAS REGULATOR CO.

ANDERSON, INDIANA

SEND FOR A SAMPLE



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We want Semet-Solvay Eight Point Checker Brick for water gas carburetors and superheaters to introduce itself to you.

After you have handled it—felt its weight—studied the possibilities in its unique design—you will better realize how it can do all we claim for it, in reducing the cost of gas, speeding up the machine and far outliving ordinary checkers.

Your inquiry will bring you a sample and the complete story, at no obligation to you.

Semet-Solvay Engineering Corporation

40 Rector Street • **New York, N. Y.**

A Gas Plant of the Seventies

The Goad of Competition

ANY human undertaking that is not confronted from time to time with more or less perplexing problems might be said to be in a state of senile decay; and failure to recognize such problems, if existent, amounts to about the same thing. Hence the fact that many of our best minds are scratching their heads in an effort to solve the various problems that have cropped up in the past several years is prima facie evidence that the gas industry is not as yet looking for a wheel chair in which to roll itself towards oblivion.

We repeat; the acknowledgment of our manifold problems represents a rather good preliminary health status. Given this running start, only sheer laziness and stupidity can cause a decline in our ability to carry on. These latter attributes have never in the past hundred years appeared in the gas man's lexicon—that is a matter of record. Accordingly, as the goad of competition digs under our hide and introduces new and tedious problems, we can take heart in the thought that we can solve them to our satisfaction.

Indeed, we should ignore the few minor injuries we have suffered and be thankful that they will serve as an instrument to urge us to greater accomplishment. While the energetic efforts of the coal, oil and electric industries to edge into our field make up the major elements of competition now facing us, in the past we have successfully mastered goads of virtually the same intensity—and always we emerged in a happier healthier condition. But, floating along on past records will not of itself guarantee our continuing to do so.

We must overhaul the old ship from stem to stern —and this first necessitates an inventory of our man power, or rather brain power. As we muster our batallions for the onset every man must contribute an effort of value—or else he must be dropped from the ranks and the proper man recruited in his stead. Make no mistake as to this first prime requirement. Check up every man in your organization, from president to office boy. If they are a bit weak for the task to be done give them a reasonable chance to come through, but dispense with them if the probationary period finds them still wanting.

Next plan your line of attack—and stop short of nothing, even the barking of a few directorial shins, once you are sure your campaign is founded on sound premises. And, just before you *lead* your men over the top, instill in them a fine sense of loyalty—let them know that they carry on for a fine industry in a he-man undertaking. Let every employee know that his ideas are welcomed, because these comprise an ammunition of a sort which is so galling to our adversaries.

All of these requisites for successfully combatting competition are at hand; merely the exercising of common sense, ingenuity and a trifle of bodily energy will keen their edge for the task that lies just ahead.

We have noted that our past accomplishments should clothe us with confidence. Let us hark back some fifty-six years, to the meeting of the American Gas Light Association in New York, October 1876. Let us see what one of the stalwarts of those by-gone days had to say on the subject of selling gas ranges.

Although this convention paper, which was published in the November 16, 1876 issue of American Gas Light Journal, carried no special title we deem it appropriate to head it as it appears below.

Trail Blazing for Gas Cooking

JAMES M. STARR

President, Richmond, Ind., Gas Company

HAVING had several invitations from our worthy secretary to present to you an account of my experience and success in introducing the use of gas for culinary purposes in my city, Richmond, Ind., I felt I could not excuse myself from complying with his request, as I think it has been of great benefit to my company and to my consumers, for its convenience and comfort in cooking. The use of gas for cooking has not only retained, during the coal oil furor of the last two years, many of our consumers of gas for illumination, but has caused many others to fit up their houses for gas burning.

In my city over 90 per cent of the dwellings have gas stoves set, all using them more or less. Many during the warm weather do their entire cooking and ironing with them, others using them only in preparing their morning and evening meals, and some only in preparing tea, being tender on the subject of gas bills.

For ironing, it is especially comfortable and convenient, enabling a person to do the work in much less

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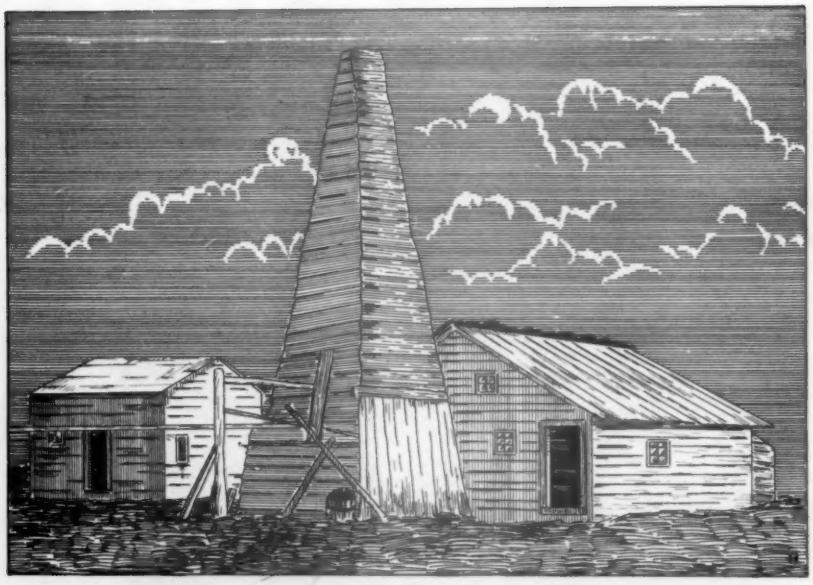


Well and Housing of Nearly a Hundred Years Ago

time, and with greater comfort and pleasure.

In heating irons, care should be taken to frequently wipe the moisture off the iron until it is heated, which prevents the iron becoming rough. And in cooking, wide bottom vessels are the most economical, as the heat has a greater effect on them.

In using them, for economy, I advise consumers not to cook or boil more than they want. It is not good management to boil a gallon of water, when they only want to use a quart. A great deal of the cheapness is due to the fact that the fire is as hot in a minute after it is lighted as it is in an hour, and when the cooking is done by turning off the gas, the expense ceases, which is not the case with coal or wood fires.

It was quite accidental, my introducing it for cooking, as I had feared it would increase the gas bills so much that consumers would quit burning gas entirely. I noticed my servant girl was using upon a bracket a little tin gas stove, and a quart fruit can, for heating water for tea and other light purposes, when there was not any fire in the cook stove, and keeping the kitchen cool and pleasant for her to work in. As my forte, (if I have any) is to have things handy about the house, I had a convenient shelf made, and placed on it two No. 3 Dome stoves, and soon found that about all the cooking of my family was done on them. My people were so pleased with these stoves that I set an experimental meter to ascertain what it cost to cook with them. I found that with gas at $3.60 per M. it cost from 1½ to 2 cents to prepare breakfast for our family of four persons, and from 3 to 5 cents to prepare dinner; also from 1 to 2 cents for tea for us—altogether two to three dollars per month for cooking and ironing. Allow me to add that these figures require care and do not include washing, housecleaning, etc., nor do they apply to very large expensive families where several courses are served, but they do apply to the thousands and tens of thousands who would love to have its comfort and convenience, if they only knew how cheaply it could be obtained.

Having ascertained what it cost to cook with gas, it was necessary to find whether it was cheaper than wood; so I had a cord of dry wood weighed and found at the prices we then paid for it, (with sawing and splitting the wood cost about $7.00 per cord) I found that five lbs. of wood cost one cent. We then weighed the wood for different meals and found it cost a considerable per cent more than gas; besides the increased trouble and danger of a wood or coal fire. Many using these stoves say it is not half the trouble to cook with them that it is to cook by a wood or coal fire.

Being armed with these facts, I adopted Mr. Gough's advice on the temperance question, "to agitate." And I did agitate and agitate, and advertised, and was puffed by locals, and I talked as I never talked before that there was money in it. I brought it before the people until nearly all have them, and all new consumers get them.

At first I put them up to be used a month and if not liked, to remove them, free of cost. I never had to take out but one set, and in that case the wife objected to her husband having them put up, and she only cooked one meal on them; she was determined not to use them, and she did not, thus verifying the old adage that to "convince a man against his will he will be of the same opinion still," and I suppose it is the same with woman.

I have erected at my rooms a cabinet kitchen. I call it by that name for it looks like a cabinet or library when closed. In it we sometimes prepare a meal for a dozen persons, and then close it up and eat by it, and a stranger would think he was eating in a library instead of a kitchen.

It has a chamber in the upper part which is connected with the chimney, which takes away all the odor of cooking. We think it is a complete success for beauty, convenience, and comfort. I have endeavored to lay before you my experience and observations, believing it is to the interest of gas companies to bring about a more general use of gas for every purpose to which it can be economically applied, thereby increasing the demand, and consequently enabling them to reduce the price to the consumers, and inducing them to use it in lieu of other more disagreeable and expensive articles.

How applicable is the above to present day conditions; what a whale of a chap to have on a range selling campaign committee, this man Starr! He believed in gas; he had faith in advertising; he appreciated the value of research—lastly, and more important, he must have been a prodigious worker, a coat-off-and-sleeves-up hustler of parts.

We still have many Starrs within our ranks, and that is mighty reassuring. Now is the time for them to assert themselves, to the end that the goad of competition will prod us into a new and finer era of accomplishment and service.

Henry M. Riley

Editor.

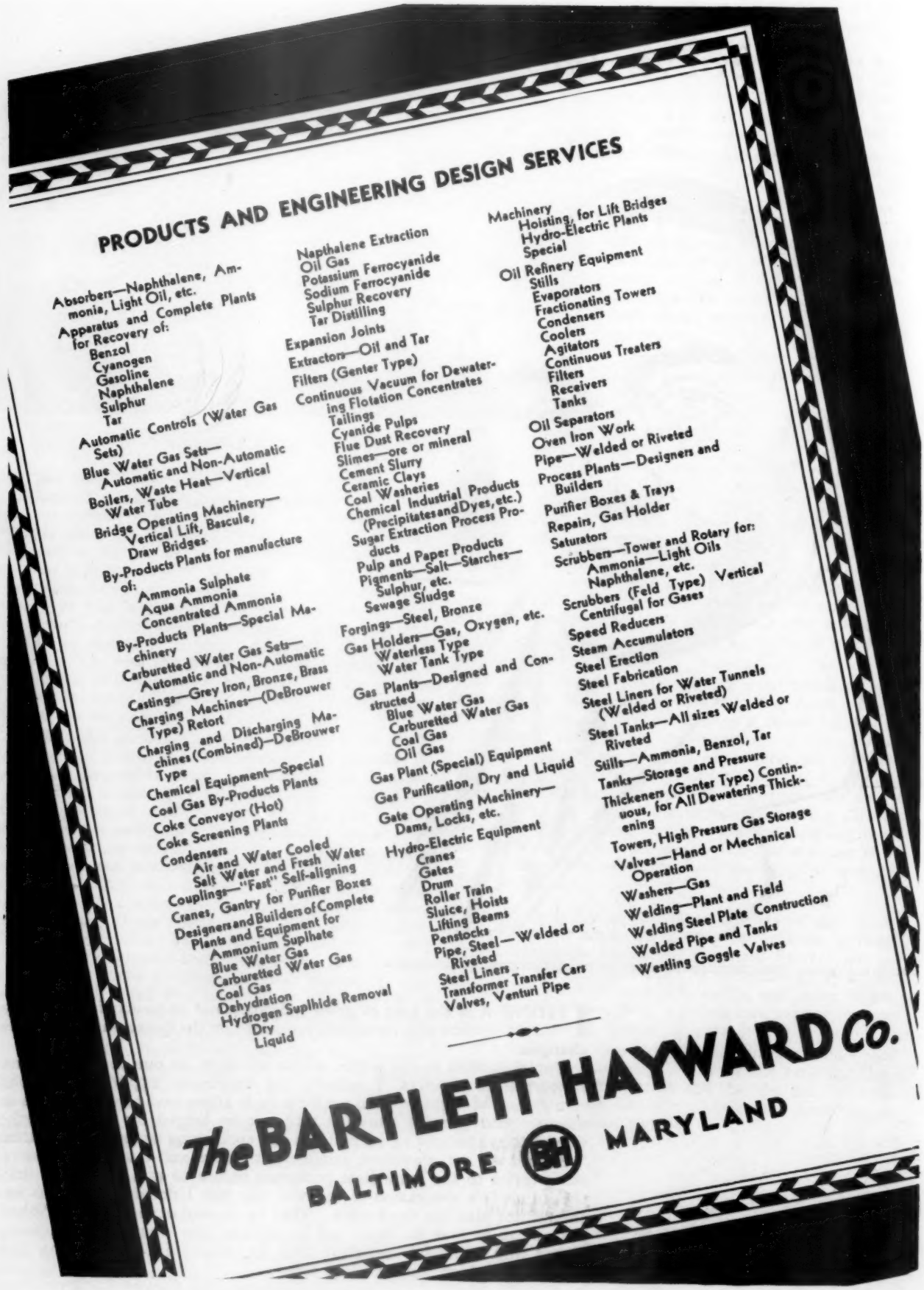
SOLVE THE DAY'S PROBLEMS

R. H. Gallagher,
President,
American Gas Association

I THINK it is the part of good judgment not to be carried away by varied opinion and immature judgment on the question of economic changes.

Our obligation to the public which we serve, to our companies, and to ourselves, requires, I believe, the maximum application of our energy and thought to each problem as it arises and to each day as it dawns. Our present situation will not be helped by looking backwards or by speculating on matters and conditions beyond our control.

Should we not, therefore, confine our labors and a large portion of our worries to the immediate problems before us and remember that the future is a succession of todays? By this I do not mean that we should not plan for the future. That is, of course, necessary. What I do mean is that we must not be tricked into dreaming of a completed and beautiful structure and be misled into neglecting the foundation which must be laid today.—

Before 1932 Meeting, New England Gas Association.

PRODUCTS AND ENGINEERING DESIGN SERVICES
Absorbers—Naphthalene, Ammonia, Light Oil, etc.
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Cyanogen
Gasoline
Naphthalene
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Tar
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Boilers, Waste Heat—Vertical Water Tube
Bridge Operating Machinery—Vertical Lift, Bascule, Draw Bridges
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Aqua Ammonia
Concentrated Ammonia
By-Products Plants—Special Machinery
Carburetted Water Gas Sets—Automatic and Non-Automatic
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Dry
Liquid
Napthalene Extraction
Oil Gas
Potassium Ferrocyanide
Sodium Ferrocyanide
Sulphur Recovery
Tar Distilling
Expansion Joints
Extractors—Oil and Tar
Filters (Genter Type)
Continuous Vacuum for Dewatering Flotation Concentrates
Tailings
Cyanide Pulps
Flue Dust Recovery
Slimes—ore or mineral
Cement Slurry
Ceramic Clays
Coal Washeries
Chemical Industrial Products (Precipitates and Dyes, etc.)
Sugar Extraction Process Products
Pulp and Paper Products
Pigments—Salt—Starches—Sulphur, etc.
Sewage Sludge
Forgings—Steel, Bronze
Gas Holders—Gas, Oxygen, etc.
Waterless Type
Water Tank Type
Gas Plants—Designed and Constructed
Blue Water Gas
Carburetted Water Gas
Coal Gas
Oil Gas
Gas Plant (Special) Equipment
Gas Purification, Dry and Liquid
Gate Operating Machinery—Dams, Locks, etc.
Hydro-Electric Equipment
Cranes
Gates
Drum
Roller Train
Sluice, Hoists
Lifting Beams
Penstocks
Pipe, Steel—Welded or Riveted
Steel Liners
Transformer Transfer Cars
Valves, Venturi Pipe
Machinery
Hoisting, for Lift Bridges
Hydro-Electric Plants
Special
Oil Refinery Equipment
Stills
Evaporators
Fractionating Towers
Condensers
Coolers
Agitators
Continuous Treaters
Filters
Receivers
Tanks
Oil Separators
Oven Iron Work
Pipe—Welded or Riveted
Process Plants—Designers and Builders
Purifier Boxes & Trays
Repairs, Gas Holder
Saturators
Scrubbers—Tower and Rotary for:
Ammonia—Light Oils
Naphthalene, etc.
Scrubbers (Feld Type) Vertical Centrifugal for Gases
Speed Reducers
Steam Accumulators
Steel Erection
Steel Fabrication
Steel Liners for Water Tunnels (Welded or Riveted)
Steel Tanks—All sizes Welded or Riveted
Stills—Ammonia, Benzol, Tar
Tanks—Storage and Pressure
Thickeners (Genter Type) Continuous, for All Dewatering Thickening
Towers, High Pressure Gas Storage
Valves—Hand or Mechanical Operation
Washers—Gas
Welding—Plant and Field
Welding Steel Plate Construction
Welded Pipe and Tanks
Westling Goggle Valves
The BARTLETT HAYWARD Co.
BALTIMORE B&H MARYLAND

Vol. 137 No. 4
October, 1932

AMERICAN GAS JOURNAL
Established 1859 Pioneer of the Gas Industry

HENRY M. RILEY
Editor

Notes on High Pressure Gas Distribution

DISTRIBUTION ENGINEER *discusses the proper procedure in running services*

SKILLFUL organization of field work will considerably expedite the laying of a service. General principles on which to work may be given, but economic installation depends on the foreman's ability to pick out the most difficult part of the service work. This part should be started immediately and effort concentrated on seeing that it does not delay the entire gang. In a well trained gang the usual work proceeds automatically. The most common difficulty is actual location of the main, due to inability of furnishing foremen with exact main details at the particular spot desired opened. To avoid unnecessary digging, only one or two men should be used to dig a narrow trench at right angles to the main for definite location.

Where concrete is to be broken it is good practice to precede the regular crew with a breaking crew. In extensive territories this is impossible, but time can be saved the service crew by opening the smallest hole possible in the concrete when installing the service, leaving the concrete replacement crew to break out the required size of slab. Maintenance of a small opening before full replacement is another advantage.

Duties of Foreman

A foreman should first check the layout as given him on the service order and sketch. If the owner is present on the premises it is well for the foreman to get final approval of the location after staking out, which usually consists of running a line between the main and the building or any intermediate angles. A mark along this line with a shovel or piece of chalk will give the owner a much clearer idea than a sketch. A measurement of the distances from the main to the location marked on the wall of the building should be checked with the sketch distances. If there is a disagreement, a distinct policy of the company will be involved. In many cases the foreman is allowed to make absolutely no change in the location or length of a service. This is the preferable policy as there may be factors agreed upon between an owner and the company, unknown by the service foreman. The owner or tenant if present should be informed of the difference and the matter taken up with the proper department within the company that same day.

It is quite common in suburban areas for the service foreman to find no one at the building on his arrival. In such a case the foreman should make no effort to enter the building, as he or any of his men who might enter can be held personally liable for property missing or damaged. While not always possible to prove that the men did the damage or removed anything from the premises, there remains the possibility of sentiment arising against the utility.

In this case a utility might establish a reputation of supplying their men with pass keys. Thus, it has some times been the practice to have the police department call the utility to secure a pass key in order to enter a building without destruction, as per local legal custom. An insistance on company representatives not entering a building without the owner, tenant, or representative present at the time will result in better public sentiment although it has disadvantages. A tenant desiring the utility to establish service previous to occupation of the

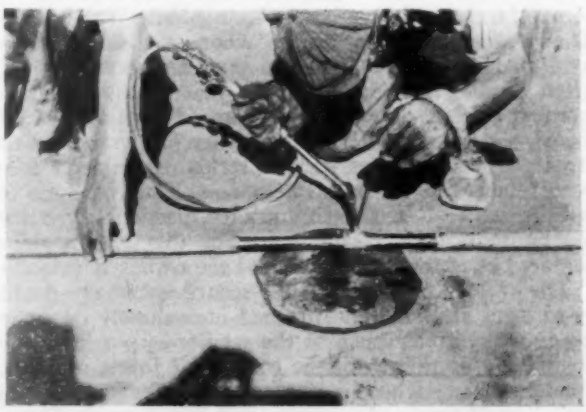


Fig. 1—Welding Service Pipe. Note steel plate under point of welding

building should have this explained to him when the order is taken, so that a key will be left with a neighbor, real estate office or representative who will accompany the men to open and lock the building. Real estate men in particular complain that this necessitates time but admit a protection both to themselves and the utility.

There is no objection to the service crew entering buildings under construction and in which other persons, neither the owner nor tenant, are working. Where the building can not be entered, necessity for the service crew returning is overcome by running the service to a point just outside the wall and blanking it off with a coupling and plug or cap. The service through the wall can be run when the fitters arrive to set the governor and meter. This is undesirable where welding practice is followed, but with proper care of threads, the finished job will be satisfactory on the comparatively few cases where running in this manner is necessary. The service crew should not drill through the wall from the outside as this would remove a large section of the concrete wall inside the cellar.

Another hindrance to installation is the necessity of driving under roadways. Here the trench on the side where driving is to be accomplished should be opened up first, allowing driving to begin at the earliest possible opportunity. Retaining walls, flower beds, tree clusters, shrubbery, heavy masonry walls, well kept lawns, and many types of cellar walls will be the controlling factor of speed on the service. These should be given special and immediate attention by the foreman, as by proper organization there will be continuous work for all members of the crew.

Need for Supervisory Judgment

On excavation, the foreman often discovers conditions not possible to discern from the surface,—bad water conditions, filled-in land, sub-surface structures, geological obstructions and roots,—all of which will require special attention. It is in these cases that the foreman should exercise the prerogative of adding to the footage of the service above the proposed length. It is well to impress on the foreman that this latitude does not include changing the general location of the service, but only the overcoming of the obstruction. The foreman's experience should be valuable to him in determining the existence of these possible sub-surface obstructions, warning the men of their probable location so as to prevent damage to the property of others and shortening the time necessary to overcome these difficulties.

Determination of exact property lines is difficult where lots are narrow and buildings close together and should be checked by property monuments, if they exist. The greatest difficulty occurs where the side lines of lots are not at right angles to the front line. Houses often parallel the front line so that if the policy of running at right angles to the front of the house is followed, a service would cross another property near the street. In other cases narrow strips of property have been retained by nearby owners, completely blocking off certain lots from a stretch entrance, particularly where the house is on a corner lot. For this reason alone, contact between the foreman and the owner is valuable.

The welder or fitter should secure necessary details as to bend locations and proceed immediately on arriving to make up as much of the service as possible. On completion of this work the coating of joints or of the whole service, where necessary, can be started with little loss of time. All joints can be made up and thoroughly tested before a service is placed in the ground. Testing above the ground has the advantage in that, being easily accomplished, better results are obtained. As the service proceeds it is often possible to complete the service and backfill sections easily opened. Where welding is used this offers no difficulties, as on smaller size pipe overhead welding is quickly accomplished.

The last work in the majority of cases is tieing in the existing main and new service. On threaded services this must be accomplished first, resulting in holding up of back fill work unless slip couplings or their equivalent are used. The foreman should be careful in the desire for speed, that this most important section of the service be structurally as near perfect as possible.

Service Installation

Routing—High pressure areas are usually divided into a number of smaller villages and towns operated from a central location. Many of these smaller divisions necessitate the full time of a fitter and helper for the doing of all types of work. The work of the service crew should be so laid out that too many services are not completed in a particular fitter's territory. By running only such a number of services as the fitter can serve with meters and merchandise without unnecessary delay, makes for better public relations. However, for economy in installation, it is always well to have a full day's work for a service crew with as little distance between as possible.

Regardless of the date the service order was issued to the construction crew, the new business department should have the final say as to which services should be run first. While this does not always lead to the most economic installation, it does provide service to those who need it. A method followed to advantage is giving the service crew all incomplete orders for a territory with the new business department's desires as to preference. This allows the service crew to go on to other services should they for some reason be unable to run in the order designated.

Use of Trenching Machines on Service Work—A few companies, especially in suburban areas, have attempted the use of small trenching machines for service work. In this type of area the average service usually does not exceed from 70 to 80 feet in length, including that between main and property line. The length on which the ditching machine can be used is restricted to a maximum of from 45 to 55 feet on the average service. Where services are scattered it is difficult to show an economy in the use of machines.

Even on longer services difficulty has been found in producing a replacement job satisfactory to the consumer. The reason for this is that the dirt is scattered more on the lawn at a greater distance from the trench than with hand trenching. If the sod is not removed by hand it leaves a very noticeable trench. Obstructions of the nature of those mentioned under procedure of installation limit still further the use of the machine. Depressions in the lawn from skids or machine treads are objectionable.

Connection to Main of Service—A single connection should be of standard design for both services and mains. No matter what the type of connection may be, the making of two or more taps and tieing them solidly together into a single service line is courting future trouble.

Complete Welded Services—Joints—While the foreman is laying out the work for the laborers, the welder secures the necessary measurements from which he can lay out his service and start welding. Having a more exact knowledge of the meter location than the main

location, the welder usually works his service from the meter toward the main. The meter end of the pipe is threaded up and a coupling and plug loosely placed on the thread for protection. Threads are also cut to receive the curb cock where a coupling and plug are placed. The cocks are not put on, as it interferes slightly with rolling the pipe when welding. Sufficient pipe is then welded up to place in the first section of trench opened, so that backfilling may start.

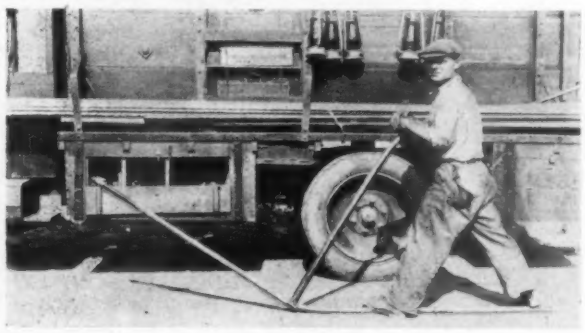


Fig. 2—Using a Hickey to bend pipe

In welding, a piece of steel plate is placed underneath the joint which assists in lining, rolling and keeping the weld free of foreign material as shown in Figure 1. It will be noted in this illustration that a mill wrapped pipe is being used. The cut-back as it comes from the mill is nine inches on the ¾" pipe shown but in cutting short lengths of pipe, six inches cut-back of the coating and wrapper is sufficient. While the enamel coating at the end of this six inches will soften a slight amount if the weld is allowed to cool of itself, it does not melt sufficiently to do any harm.

Before starting the weld, the primer should be burned off the pipe and then the joint wire-brushed to prevent the inclusion of any foreign matter in the weld. In this type of rolling weld it is usual for the welder to have a number six tip on his torch. Trials of number five tips have proved just as speedy, with a possible saving of gas and air, but the welders prefer the number six tip since they use it on small sized main work as well as service work, except in special cases. It will be noted there is an assistant to the welder who turns the pipe. In service work a welder can do this operation himself but in his other work he requires a helper who is kept with him during this short time of the actual welding.

Safety Precautions—During the actual welding the helper is also valuable in keeping the gas and air hose away from the welder and watching surrounding work, as a safety protection to the welder himself who must concentrate. The wearing of goggles and gloves by the welder are safety precautions which should be strictly enforced. The helper stays as close to the welder as is consistent with safety and non-interference.

The gas and air hoses are taped together with common tire tape at several places along the entire length. Near the torch the taping is spaced much closer. While not so important when welding above ground, in the trenches a welder should always wear a cap. A welder should also be encouraged for his own protection, to wear high shoes. Some of the welders have even carried this to the point of wearing high eye-laced boots.

Pipe Bending—After welding the sections together between meter and curb cocks any bends necessary are put in the pipe by means of a hickey as shown in Figure 2. The bend should be made in as long a sweep as possible by changing the location of the hickey as the pipe is bent. In ¾" and 1¼" services bending can be done cold without injury to the pipe—if the radius of the bend is made large enough. A tool such as a hickey should be used rather than bending the pipe around any solidly held obstacle.

With the hickey a neater bend can be made and also the location of a bend is more likely to be at its proper place. Right angle bends are easily made before the pipe has been carried to its final position. But where bends other than right angles are required, the pipe should be laid over the trench and bent in position.

If a mill or central station coated pipe is used, there will be some damage done to it. This must be carefully watched and replaced in the field, especial attention being required where the coating has been wrapped with kraft paper. This paper will sometimes stretch to such an extent as to conceal the defect.

Placing Pipe in the Trench—By the time various sections have been welded, the trench from the house to the curb cock, or at least part of it, has been opened and the hole drilled through the wall. The pipe is then placed in the completed section of the trench and through the wall. The welder who also acts as fitter removes the cap, places the meter cock and pulls the service through so that it is at the proper distance from the wall. This distance varies in practice from 3½ to 6 inches between the wall and the nearest side of cock. The main reason for spacing is to secure sufficient room for the placing of a wrench on the service pipe while placing the cock or other fittings on the service, and to allow clearance between wall and governor. The greater the distance, the more the governor may be swung back against the wall.

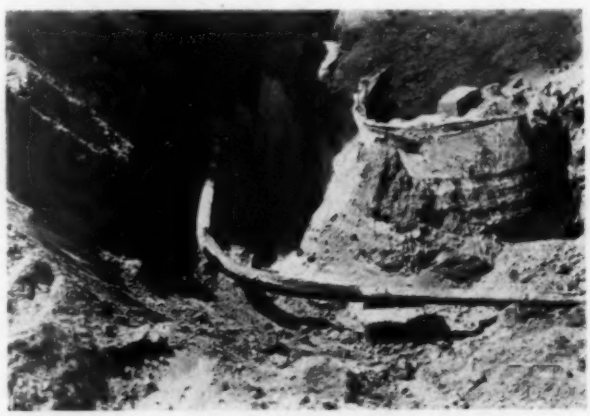


Fig. 3—Field Repair of damaged Coating at Bend

The helper on the outside then starts to grade the service by placing bricks underneath the pipe if the trench is too low or removing additional dirt if too high. Wood blocks should not be used underneath the service as they would rot out, allowing the service to sink and also retain an excessive amount of moisture which would increase the rate of corrosion. Later when the back fill is placed in the trench, it should be tamped underneath the service to give a solid bed. Note in Figure 3 the field repair of damaged coating on the bend. The man doing the grading should put just sufficient back fill at several locations to prevent movement of the pipe in the course of regular back fill or the changing of the position of the meter cock.

In threading for the meter cock only sufficient coating should be removed to allow of placing and the using of

the stock and dies. The coating should project slightly inside the wall. If the remainder of the service is not ready for such work as the welder or helper might do, either of them can cement up the wall of the cellar which should be done from both inside and outside, making certain that no pockets remain where water may accumulate.

Fig. 4—Tacking Tee onto Main

As soon as possible the curb cock should be installed and the service placed in the trench from the house to the curb cock. This section should then be tested and the joints and section just before the curb cock coated. The coating should not be allowed to cover the curb cock. This is especially important where enamels are used.

Where necessary, another part of the crew has been driving the service underneath the road. The helper can then proceed with tieing in this section to the curb cock while the welder is getting his measurements at the main. As soon as this is finished the welder is ready to tack his tee in position, first onto the service itself and then onto the main.

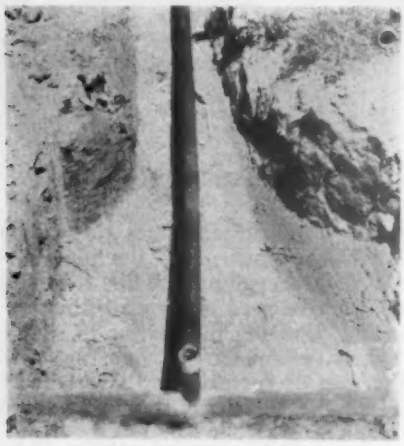


Fig. 5—Slight Angle at tie-in point between long leg of Tee and Service

When tacking the tee onto the main, the helper should keep a wrench on the service as illustrated, Figure 4, so that the tee is kept down against the main with the proper spacing. While this sometimes leaves a slight amount of strain in the service, care should be exercised so that the strain is a minimum. One distinct advantage of welding will be noted on the 1¼" service illustrated in Figure 5 where there is a slight angle at the tie-in between the long leg of the tee and the service. Had this been a screw connected service some strain would have been left.

Testing—The service is now ready for test. With a compressor available, it is a simple matter to connect to the top of the service tee as shown in Figure 6, and each joint not previously tested should be tested. If a compressor is not available it is a simple matter to make up a fitting so that a tire pump can be used with which to secure the pressure. A method sometimes used but not encouraged is the connecting up of the oxygen tank to the service and using its pressure. The helper should field coat the remaining bare spots on the service and set the curb box so that back fill can proceed. Where lubricated curb cocks are used with lubricating screws, the lubricating channel should be left filled for ease of future use.

Curb Box—The curb box can then be set in position. It should never rest on the service itself as any excessive weight on the curb box would shear the service. To support the curb box a brick should be placed underneath it on each side of the curb cock, it being advantageous to set the bricks slightly under the curb cock as an additional bracing for it. Bricking under the curb box prevents settling. It is difficult in numerous cases

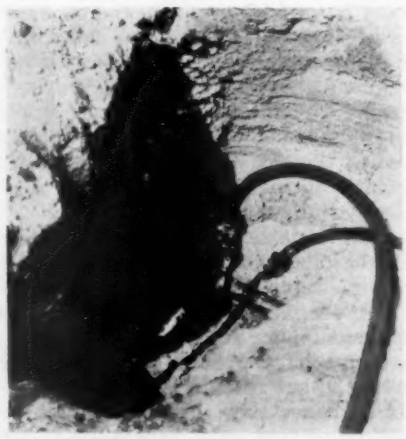


Fig. 6—Connections for Service Testing

to judge at what elevation the top of the curb box should be left. This is a matter for the foreman to personally supervise as his experience will be valuable.

After filling in around the curb box the top should be removed, a key inserted and the cock turned on and off. The reason for this is that in casting many boxes, a flaw remains that will not allow the insertion of a key. It will also show that the box has been centered over the curb cock and that the key can be placed on the cock without difficulty. The general policy for the foreman to keep in mind is that every part of a service he installs should be tried out completely, so that any function it is called upon to perform during its life will be known to operate satisfactorily.

Service Tee—In Figure 7 is shown a coupling and plug on the top of the service tee. A recessed coupling is advantageous in that, having a recess, its installation under pressure is facilitated and it has a greater safety factor against leakage. Where a cap is used a tight joint can not always be assured, as the thread on the tee may be run up to such an extent that the top of the tee butts against the inside of the cap. With the joint compound in place and still soft, the cap may show a tight joint on test. Caps placed in this manner with the pressure left on only fifteen minutes have shown leaks.

The advantages of the coupling and plug are sufficient to offset the disadvantage of two joints in place of the one joint on a tap.

Fig. 7—Coupling and Plug on top of Service Tee

In placing the top on the tee the employee doing the work should wear gloves and goggles. When taking the tapping machine off and catching the plug on the tee the gas is blowing free, carrying with it sharp particles. Tapping is done with any standard high pressure tapping machine.

The most difficult place to field coat is at the service tee. If a wrapper is used it must be of a flexible type. It will be noted in Figure 8 that the coating and wrapper are placed on all parts of the tee, together with the coupling and plug.

The service should be supported close to the tee by means of bricks underneath, as shown in Figure 8. The

Fig. 8—Service Tee field coated. Note service supported by brick

bricks used for this purpose are those that have been taken out of gas generating equipment or the tearing down of brick structures. In a gas utility, especially those manufacturing water gas, it has never been found necessary to buy brick. In a natural gas concern the little cost of purchasing brick is worth the safety resulting from their use. Safety is mainly prevention of breakage.

(Continued in December issue)

Summary of Gas Company Statistics for July, 1932

REVENUES of manufactured and natural gas utilities aggregated $43,071,308 in July, as compared with $45,507,068 in July, 1931, a decline of 5.4 per cent according to reports from companies serving some 13,904,904 customers and representing about 90 per cent of the public utility distribution of manufactured and natural gas. This represented a distinct improvement over the two preceding months, since in June revenues were down 7.8 per cent and in May 8.7 per cent below the levels of the preceding year.

While total sales of both manufactured and natural gas declined for the month, a change of some significance was manifest in sales for domestic purposes, which registered a small gain during July. This was the first month of the current year to witness any increase in domestic sales, and was attained despite a loss of more than 330,000 domestic customers during the year ended July 31, a drop of nearly 2.5 per cent.

Revenues of the manufactured gas companies aggregated $28,438,466 for the month, a drop of 2.8 per cent from a year ago. The natural gas utilities reported revenues of $14,632,842 which were about 10 per cent under the figures for July, 1931.

Sales of manufactured gas reported for July totaled 25,597,762,000 cubic feet, a decline of 2.5 per cent, while natural gas utility sales for the month were 38,830,323,000 cubic feet, a decline of some 13.5 per cent.

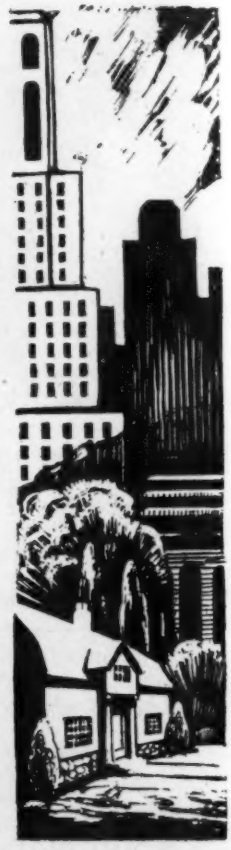
New England was one of the few sections of the country where conditions ran counter to the general trend of increased sales for domestic purposes in July. In this region domestic sales for the month were down nearly 5 per cent, the result in large part of a loss of some 35,000 domestic customers during the year, a decline of 3 per cent.—*Paul Ryan, Chief Statistician, A. G. A.*

Value of Gas and Other Meters Manufactured in 1931

THE U. S. Bureau of the Census announces that, according to a preliminary tabulation of data collected in the Census of Manufactures taken in 1932, gas, water, and other liquid meters, gas generators, and parts and accessories were produced in the United States in 1931 to the value of $21,164,407 (at f.o.b. factory prices) by establishments engaged primarily in the manufacture of this class of products. The value represents a decrease of 44.3 per cent as compared with $38,000,936 reported for 1929, the last preceding census year. The more important items which contributed to the total for 1931 are as follows: Gas meters, $4,958,322; gas regulators and governors, $2,234,461; water meters, $5,987,792; meters for liquids other than water, $2,929,457; gas generators, $1,781,294.

In addition, gas meters, etc., are made to some extent as secondary products by establishments engaged primarily in other lines of manufacture. The total value of these commodities thus made outside the industry in 1931 amounted to $2,069,391, equivalent to 9.8 per cent of the value of the production within the industry.

Load Building from the Domestic Viewpoint



LOUIS STEIN

Director of Gas Sales, Northern States Power Company, Minneapolis, Minnesota

The opinions expressed in this article are not necessarily to be construed as part of the policy of Northern States Power Company, but are the viewpoints and expressions of the author personally.—Editor

IN the beginning — there should be a clear understanding of what is meant by Load Building. The remarks which follow are only pertinent to the extent that they adhere to the idea that the term implies *retention of existing load* simultaneously with the *acquirement of new profitable additional load* with no substantial increase in plant or distribution investment.

Unless you can agree that the true objective of appliance activity is to Build Load—within the meaning described—it would be silly to read further. It is difficult to conceive, however, of anyone who professes a profound interest in the Industry, who cannot subscribe to this purpose and do so without mental reservations.

The problem of accomplishing the foregoing objective is open to two avenues of approach. One may choose to view and analyze the matter in a strictly academic way or to apply methods of reasoning which are founded on practicability. In the former instance there is great probability of becoming hopelessly involved in an intricate maze of theories and hypotheses, which, while provable, may not be proved. In the latter case, on the other hand, the problem may be attacked in a fashion which involves no obscurities.

What follows is predicated upon the second—practicable—view. It only seeks to suggest a method of evaluating load and a means for obtaining it, which is reasonable in cost and yet compatible with the value of the business secured. No doubt, too, other similar ideas of equal or better value will be evolved from this discussion. It is also possible that the Industry's archives contain identical suggestions, uttered so long ago as to have been forgotten.

Regardless of what has gone before or what even may exist at present, consider the case of Avridge City, U.S.A. Avridge is a town of 38,000. It has had a gas utility serving it for one and a half generations. Exclusive of its industrial gas business, it numbers on its books some 7,000 residential customers. Of these, all use gas for cooking. Only 3500, however, have gas water heaters of any type. Not over 100 have gas refrigerators. There are approximately 1,000 dwellings along the mains which do not utilize gas for any purpose. All of these are classified by the management as good prospects for gas service.

For the purpose of simplifying this discussion, there are no house heating customers and the existing rate structures do not contemplate the promotion of this class of business. Assume further that Avridge is situated in the northern half of the country in a geographical section where, when "—winter comes," spring is still something to read about. The available rates are such as to cause the exclusive cooking customer to pay $1.50 per M.C.F. and that the customer who uses gas for both cooking and water heating will pay at the rate of $1.00 per M.C.F. for water heating. The calorific value of the gas distributed is 530 B.t.u. and the average use for cooking and water heating is as follows: 18,000 cubic feet annually for cooking; 36,000 cubic feet for automatic water heating and 7,500 cubic feet for circulating tank water heating.

With this general information in mind, the management of Avridge, pressed by its directorate to materially and quickly improve its earnings, consults the sales and engineering departments as to possibilities and the attendant operating and investment problems, if any.

The outcome of the conference is a summary of the matter which looks like this:

Avridge City, U.S.A.

Estimated Revenue and Cost of Service of Additional Domestic Load; Two Field Men on Five Year Sales Effort

600	New Water Heating Customers @ 36 M.C.F./Year	21,600	M.C.F.
100	New Water Heating Customers @ 26 M.C.F./Year	2,600	M.C.F.
300	New Water Heating Customers @ 7.5 M.C.F./Year	2,250	M.C.F.
500	New Cooking Customers ..... @ 18 M.C.F./Year	9,000	M.C.F.
250	New Refrigeration Customers.. @ 18 M.C.F./Year	4,500	M.C.F.
	Total Sales Per Year—After Five Years.....	39,950	M.C.F.

* * * * * *

Additional Investment—Engineering Estimate:	
Plant	$15,500
Distribution System.....	14,000
Total	$29,000

* * * * * *

Revenue		
Water Heating, @ $1.00/MCF.....	$36,450	
Cooking @ $1.50/MCF.....	13,500	
Refrigeration @ $1.00/MCF.....	4,500	
Total	$54,450	(A)

Cost of Service		
Fixed Charges, 12% on $29,000 (Investment)..	$3,480	
Operating Expenses, 39,950 MCF @ 55c/MCF.	21,973	
Total		$25,453 (B)
Revenue Remainder Available (A minus B).....		$28,997
Remainder Per MCF.....		72.6c (C)
Net Worth of this Revenue Per MCF (C)—See Note "a"..		$5.08

Note "a"—This is *present* Net worth on 10 year basis at 7% compounded annually. In other words, 72.6c per MCF in 10 years would produce $7.26. But—TODAY—it is only worth $5.08. The difference, $2.18, represents the cost of using the 10 years' revenue just as though it were being borrowed at a charge of 7%, compounded annually.

From the foregoing it will be seen that it is now possible to calculate the Present Worth on a 10 year basis of the load of any appliance to which a fixed rate of yearly consumption may be assigned. For example: the operating statistics of Avridge reveal that the annual gas consumption on a popular size self action storage water heater is 36,000 cubic feet. From the Summary of "Estimated Revenue" it has been shown that the Present Net Worth on a 10 year expectancy is at the rate of $5.08 per MCF. Multiplying this figure by 36, the product obtained is $182.88, which sum represents the PRESENT net worth of this appliance if it is used at the rate of 36 MCF per year for ten years.

Similarly, a cooking load of 18 MCF per year will be evaluated at 18 times $5.08, or $91.44. A refrigeration load of 18 MCF per year is likewise evaluated at $91.44. And so on down through the list.

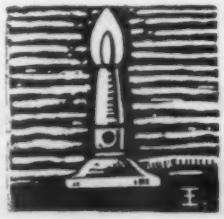
Compensation for Obtaining Load

The next matter to determine is just how much of these sums may reasonably be spent as compensation to acquire the load which each appliance will produce. Obviously, if a fixed percentage of each sum is applied throughout the entire list of appliances, selling inequities will result which will tend to defeat the end in view. For example: suppose it has been decided to pay 15% of the present worth of each load as compensation for obtaining it. It has been shown in the foregoing that the cooking and refrigeration loads have been evaluated in the same sums, namely, $91.44 each. 15% of this amounts to $13.71. If it may be assumed that $13.71 is a proper compensation for obtaining a cooking load of 18 MCF per year through an appliance listed at $75, then $13.71 is, comparatively, inadequate for obtaining a refrigeration load of the same number of cubic feet through an appliance which will cost the customer $175. This appears to be true for the reason that, on the one hand, the range is low priced and has general public acceptance, while on the other, the refrigerator is much more costly and has limited acceptance.

It would appear, therefore, that each type of load will have to carry its own specific compensation, within the limits of its present net worth and still bear a relation to the other units of compensation which will keep the efforts of the field salesmen in the channels most desired.

Even a casual examination of the value of Water Heating load will indicate its prime importance in a study of this kind and for that reason it seems logical to give it first consideration. The management of Avridge decided to put the following New Business Compensation Schedule into effect, having in mind that it already had on its payroll, two men of whom one at least was qualified to obtain satisfactory results under the new plan. The second man, though of a type who would be satisfied with a standard of living compatible with an income of $1500 a year, was to be tried and displaced if found wanting.

Refer to Schedules A and B herewith.



Compensation Schedule "A"

New Gas Business

Type of Load	Compensation		Remarks
Water Heating—Domestic			
20 Gal. Stge. (Fast Recovery)..	$26.00	Deduct $7	For failure to remove furnace coil *and* all coal auxil. water heating equipment.
30 Gal. Stge. (Fast Recovery)..	$39.00	Deduct $10	
40 Gal. Stge. (Fast Recovery)..	$52.00	Deduct $14	
45 Gal. Stge. (Fast Recovery)..	$58.50	Deduct $17	
50 Gal. Stge. (Fast Recovery)..	$65.00	Deduct $21	
60 Gal. Stge. (Fast Recovery)..	$78.00	Deduct $30	
135 Gal. Stge. (Fast Recovery)..	$175.00	Deduct $60	
Tank Heater—Circulating.....	$5.40		
Cooking—Domestic			
Range—4 Burners and Oven...	$13.00		
Range—Bungalow	$10.25		
Rangette	$9.75		
Hot Plate—3 Burners.....	$5.80	Must Be Installed In Kitchen	
Hot Plate—2 Burners.....	$3.85	Must Be Installed In Kitchen	
Laundry—Domestic			
Hot Plate or Stove—3 Burner...	$4.35		
Hot Plate or Stove—2 Burner...	$2.90		
Dryer	$20.00		
Ironer	$4.00		
Other Domestic Load			
Less than 18 cu. ft. Boxes.....	$21.00	Refrigeration	
18 cu. ft. or more, per unit....	$50.00	Refrigeration	
Radiant Heater—Fireplace.....	$7.50		
Gas Radiator, Per Unit.....	$15.00		
One Car Garage Heater.....	$37.50		
Two Car Garage Heater.....	$60.00		
Three Car Garage Heater.....	$94.00		
Incinerator	$7.00		
Furnace Coil Removal.....	$5.00	To Plumber On His Own Sales Only	

Note—Foregoing rates applicable where appliance is sold through company's appliance department. Otherwise, apply Schedule "B". Furthermore, Schedule "A" does not apply to any sales which are replacement appliance sales.

Compensation Schedule "B"

New Customers

Restoration of Dead Service (See Note A) As per the following schedule.
and
New Service on Existing Main (See Note B) As per the following schedule.

Type of Load	Compensation		Remarks
Water Heating—Domestic			
20 Gal Stge.....	$14.00	Deduct $7	For failure to remove furnace coil *and* all coal auxil. water heating equipment.
30 Gal. Stge.....	$21.00	Deduct $10	
40 Gal. Stge.....	$28.00	Deduct $14	
45 Gal. Stge.....	$31.25	Deduct $17	
50 Gal. Stge.....	$35.00	Deduct $21	
60 Gal. Stge.....	$42.00	Deduct $30	
135 Gal. Stge.....	$93.75	Deduct $60	
Tank Heater—Circulating.....	$3.00		
Cooking—Domestic			
Range—4 Burners and Oven....	$7.00		
Range—Bungalow	$5.25		
Rangette—3 Burn. and Oven....	$5.00		
Hot Plate—3 Burner.....	$3.00	Must Be Installed In Kitchen	
Hot Plate—2 Burner.....	$2.00	Must Be Installed In Kitchen	
Laundry—Domestic			
Hot Plate or Stove—3 Burner..	$3.45		
Hot Plate or Stove—2 Burner..	$2.30		
Dryer	$5.75		
Ironer	$1.15		
New Service on New Main.....	$1.00	See Note C	
New Service to New Home on Existing Main.....	$.50	See Note D	

Note A—"Dead Service" means residence with service into building, which has not used gas for 12 consecutive months or longer.

Note B—"New Service on Existing Main"—refers to a service to be connected to a main which is more than two years old.

Note C—"New Service on New Main"—refers to a service to be connected to a main which is less than two years old.

Note D—A "New Home" is one which has been erected within twelve months preceding application for service.

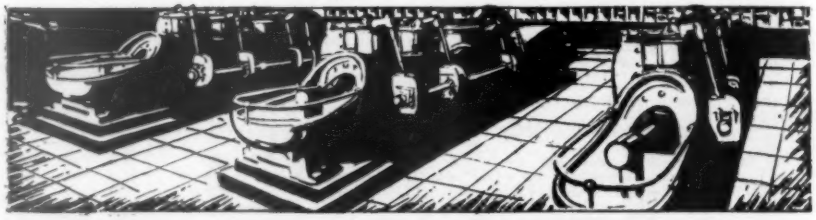
Remarks—Under this schedule, compensation will be paid only where salesmen obtain new customers, but where the appliances have been purchased elsewhere. Otherwise, compensation will be paid on Schedule "A". In no case shall a salesman be paid on both schedules for the same business.

Each salesman operating on these schedules will be required to produce a minimum volume of *New Business* each calendar month which shall not be less than 250 MCF/Year, of which not less than 150 MCF/Year shall be *Water Heating*.

Special Note—On all "replacement" appliance sales which a New Business Salesman may incidentally acquire, the Company will pay a commission of 6% of the net cash selling price—PROVIDED HOWEVER that such salesman shall not fail to meet the minimum New Business Requirements during the same month that such "replacement" business was acquired.

It is quite apparent from a study of schedules A and B that the plan in general offers a flexibility of application to almost any given situation. In this illustrative case it will be noted that the City of Avridge has not set up any arrangement for the payment of fixed salaries but instead has arranged its schedules to reveal total compensation. It will be patent to any careful observer that the whole schedule or any part of it may be revised to fit in with a desired salary arrangement in which case, of course, the rates of compensation shown herein would be approximately halved. This, under the

assumption that the base salary would be somewhere between $125 and $150 a month. The whole scheme provides a skeleton on which any individual utility may work out its own particular schedules.



To those who are especially interested in providing for dealer arrangements, a schedule similar to those shown may be worked out embodying the same fundamentals. The matter of what should be done in this particular direction is so involved and open to so many different schools of thought that no recommendations are made here to cover that phase of sales activity.

Importance of Replacement Sales

It appears necessary to say something concerning replacement sales, more especially that phase of it which deals with ranges. It would appear at this date that a sales program which is devoid of this consideration is incomplete for several reasons. Because the survival of the gas business depends so largely upon the popularity of gas fuel for cooking it seems to be an almost undebatable fact that the replacement range business is a most important factor in the affairs of the gas industry. It is almost axiomatic that the popularity of gas must be retained in the kitchen if the cooking load is to be retained. Therefore, there should be a continuing and unrelaxed effort to replace obsolete equipment with the newer and finer ranges. Unless this is done the popularity of gas as a cooking fuel will wane, in which case it will become increasingly difficult to sell the other increment uses.

To those who would adopt a program such as that outlined herein to build domestic load without sacrificing the replacement business, there are several roads open for accomplishment, namely, complete dependence in the store to produce a proper volume of this kind of business or a field sales activity independent of the new business field activity. The adoption of either or both methods will depend entirely upon the needs and conditions surrounding the locality under consideration.

Without in the least attempting to suggest a specific method to pursue and making no implications as to how such method may affect dealer relations, so called, any company in almost any community may put its activities on the same plane as the dealer's if it is willing to confine its effort in this direction to store sales. This, of course, implies that there would be no salesmen in the field actively engaged in this channel. Many dealers in communities like Avridge City do not engage the services of field salesmen to carry on their appliance business and they believe, rightly or wrongly, that the local utility should likewise limit its selling program. There are other communities, however, where the dealers have sufficient enterprise, courage and skill to successfully utilize sales programs of the same general character as the utilities.

In any case, where the utility deems it best to confine its replacement business to store activities exclusively, such a program will have to be supported by well trained personnel and as good or better advertising as the best retail stores in the particular community sponsor. It is also suggested in this connection, though it may seem a trivial matter, that the store hours conform to the buying habits of the community in which it is located. This may mean that the store should be kept open one or two or three evenings a week or it may involve no late hours whatsoever.

Employees' Use of Company's Service

Whatever sort of program a gas company may adopt with reference to appliance sales, it is vain to hope that it will succeed unless and until its employees—President to Janitor—visually demonstrate their own confidence and satisfaction with the several types of gas service offered by actually using the various appliances which the company is asking its customers to use. Lack of employee use is a formidable stumbling block to sales results in many places and until employees *do* use the company's appliances and service it may not hopefully look forward to a successful outcome of load building effort among its customers. In this connection, therefore, and regardless of what degree of success an appeal to employee loyalty may have, the suggestion is made that there be an adherence to a policy analogous to that which was adopted by the City of Avridge.

In addition to providing a load building program for its sales department, the management, in order to do everything physically possible to remove all sales handicaps, notified its employees that it had changed its policy with respect to the purchase of appliances and had arranged to sell to employees any of its major appliances at prices which actually was cost to the company. What the management of Avridge really did to arrive at a proper appliance price schedule for employees was to determine what each appliance cost at the factory and added thereto the following items of expense:

Transportation
Purchase and Warehouse
Local Delivery
Installation
Plus 5%

This price was made available so that the various articles could be paid for on a 12 months' basis with no added carrying charges. To those who wished to pay cash a 5% discount was applied.

In conclusion and with general reference to all that has gone before in these remarks, there will be many to whom this will appear as an extremely radical departure from customary methods. Likewise there will be many proponents of the program. Whatever the reaction or mental attitude toward this departure, it should be said that nearly every business in existence is now confronting a situation which is radical indeed, in comparison with what one chooses to call normality. If the reasoning upon which a sales structure is founded is fundamentally sound and each unit comprising the structure has been carefully measured and has been skilfully inserted into its proper place, the result of such ensemble will be as sound and rugged as the foundation upon which it was built.

Load-Building From The Industrial Viewpoint

A. F. MITCHELL

Manager, Industrial Gas Dept., Northern Indiana Public Service Company, Hammond, Indiana

THE problem of load building is a vital one at all times. However, it would seem that a greater problem confronts us at this time and that is holding the present load. This condition will not continue much longer, therefore we will endeavor to briefly point out a few pertinent facts worthy of consideration in connection with the subject.

It must be agreed upon at the start that similar opportunities as existed in the past will present themselves again in the future. These problems must in some way, as far as possible, be solved in favor of gas fuel.

Emphasis should be given to the inherent quality of gas as a fuel when properly applied. In a large majority of instances where applied it has shown economies in costs per unit of product in excess of that previously expected. This fact should be given consideration on new applications of gas with the expectation that conditions will invariably repeat themselves. The small amount of failures will be outnumbered by the successful cases.

The education of the prospect as to the value of gas as a fuel when compared with other fuels is important. He undoubtedly knows some of the advantages to be gained and often will admit them in a general way. However, he either does not know or for financial reasons will not admit many of the advantages to be gained, therefore it is essential that all the known economies due to gas be brought out and agreed upon. This may require quite some additional time, according to all the factors involved, but the permanence and satisfaction of the finished job is involved in a large measure in these precautions.

The proper application of gas in order to obtain the best results is very essential. Present development of the art is always a limiting factor. Our aim should be to induce the customer, if possible, to use the most modern appliances in order to obtain the greatest benefits for all concerned. This is not always easy due to the lack of knowledge of the problem involved.

Equipment and Heat Control

Too much emphasis can not be laid upon equipment if success is to follow our efforts. The future development of gas using appliances will make possible new uses for gas and add load tomorrow that was not possible yesterday. Some of the factors connected with equipment are: correct design and capacity, proper installation and instructions for economic operation. Great strides forward in the last few years have been made in furnaces and equipment and this should continue with greater effort in order to make gas accomplish more for the customer than any other fuel. Cooperation of the gas sales engineers in passing along new ideas to the equipment manufacturer will aid materially in this work.

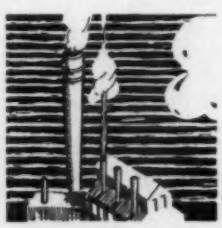
Gas is a refined fuel of the highest type and will give satisfactory economic results continuously only when treated as such. The very nature of gas makes it an ideal fuel to be controlled by modern appliances with the least interference. These advantages should be embraced, and given careful consideration wherever gas is used. Many loads that have been lost can be regained again, and easily held if this advantage is followed. Industry wants their product to be of the highest possible quality repeating those conditions day after day. This objective when once attained will result in the manufacturer selling great quantities of his product and holding satisfied customers, therefore the first cost of the refined fuel is often justified even when higher in prices than crude fuels.

The trend of the times would seem to indicate that the public demands are for increased quality at a lower price. This is plainly evidenced in the automotive industry. One of the factors influencing cost is labor, and labor at its best can not continually and untiringly control heat nearly as well as a mechanical device. Industry must have a certain amount of intelligent labor but quality, quantity and cost should not be a secondary consideration. Automatic control of heat must continue to make progress both in design and application in order to build up the gas load.

Surveys and Research

Where competitive fuels are concerned it is impossible to reach any definite conclusion without making an analysis of all the factors involved. A general idea of what can be accomplished by gas when applied to a certain operation may be obtained from similar applications elsewhere. This is a short cut method of survey and its value is questionable because of the details that are lacking. Different industrial plants manufacturing the same kind of materials vary their methods in many ways, such as the quality of crude fuel used, method of handling the fuel, heating equipment used, quantity production per unit of time, quality of product and many other details that can only be brought out by a careful survey. Surveys are a vital part to the sale of gas. The greater the competition in fuels the more necessary careful accurate surveys become. The sales engineer has a problem in surveys that will in a large measure determine his value to the gas industry.

Research in industry is making rapid strides. Whether this is good for the human family or not is a question foreign to this paper but we do know that this is a "machine age" and we are making what we call "progress" in this manner. We are striving toward what is known as perfection and some of the essentials that go to make up this high aim are quality, quantity and costs. If research is making headway in the sale and use of the cruder fuels then we must redouble our



efforts along this line if we are to hold the load we have and make progress in building up new loads.

Influence of Rates

The most highly competitive division of the gas business is found in the industrial heating load. This competition is increasing in intensity and presents some problems not experienced during at least the last decade. It must be admitted that gas must be priced at a figure that will show a profit to the consumer over competing fuels and this figure must keep pace with the varying quantities used. If, for example, the interest and depreciation on an oil storage, heating and distribution system is, say, $1,000.00 per annum then the cost of being ready to serve such a customer with gas should not exceed $83.30 per month. This same procedure could be followed with other industrial fuels. If it is assumed that many large industries have varying classes of heating operations differing in their requirements as to closeness of temperature control or conditions of furnace atmosphere then a block rate will be justified and the customer will agree to the fairness of such a rate and distribute his costs accordingly. While it is true that the sale of gas to industries must bring a fair return it is also true that many of our largest manufacturers have reached enormous volume of sales based upon small unit profits. Small profits per unit of gas sold will build load in the face of fuel competition and large volume sales will build up the total amount of net profits.

The present outlook on the field of industrial fuels is that competition is increasing and the advantages of gas fuel are being more closely scrutinized by the customer. The sales organization is therefore required to make greater efforts in load building. The greater the knowledge of the possibilities of gas the greater the amount of new business secured. Attempts to take on this available load through the efforts of men not specially trained will result in failure. The amount of success will depend upon an intimate knowledge of such phases of the work as surveys, rates, competing fuels, furnaces, burners, automatic controls, and finally to present the advantages for gas in an acceptable manner to the plant executive and from him all down the line to the furnace operator.

Conclusions

Management must thoroughly believe in the advantages of gas sales to the industries and be ready to cooperate with the sales organization in making liberal allowances for demonstrations, trials, research and development of equipment on a scale commensurate with the revenue expected from the increased load. When facts concerning the advantages of gas are properly presented to the prospect, and if necessary, demonstrated to be facts, then he will require such service at a price he can afford to pay. Our problem is therefore one of finding out what industry can afford to pay and if possible making it available on that basis.

Production of Natural Gasoline in 1931

THE production of natural gasoline in 1931 totaled 1,831,918,000 gallons, valued at $63,732,000. These data represent declines of 17 and 42 per cent, respectively, from a year ago. The decrease in output was due chiefly to a material decline in the production of crude oil. The decrease in value was a reflection of low prices of motor fuel.

The decline in natural gasoline prices during 1929-1931 was reflected both in the number of operating plants and in the number of operators. A few of the marginal, or high-cost, producers have been compelled to close their plants or submit to absorption by stronger units. The number of operating plants declined from 1,119 in 1927 to 937 in 1931, and the number of operators from 394 to 324 in the same period. Although the reduction in prices has made a pronounced change in the personnel of the industry, it has not exerted a similar effect on the productive capacity of the plants; in fact, a recent survey of the Bureau of Mines showed an increase of 8 per cent in total capacity between January 1, 1930, and January 1, 1932. This condition has resulted from the fact that the marginal plants that dropped out were of small capacity whereas the new ones, although few in number, have been of large size.

The relative rank of the principal natural-gasoline producing States was unchanged in 1931 as California retained first place with Oklahoma and Texas second and third, respectively. These three States produced 85 per cent of the total output in 1931 compared with 87 per cent in 1930.

The average yield of natural gasoline, an important factor in the rapid increase in production in the decade preceding 1929, declined for the third successive year. The average yield in 1931 was 1.02 gallons per thousand cubic feet of gas treated, compared with 1.06 in 1930. The decline in yield in 1931 was undoubtedly caused by a further gain in stabilization, which is the process of removing certain fractions in order to lower the vapor pressure. The number of plants using the absorption process, or a combination of the absorption process with others, showed a relatively greater decline than in the case of those plants using the compression process. On the basis of output, those plants using the absorption and combination processes produced practically the same proportion of the total in 1931 as in 1930. The charcoal process continued to decline in relative importance.

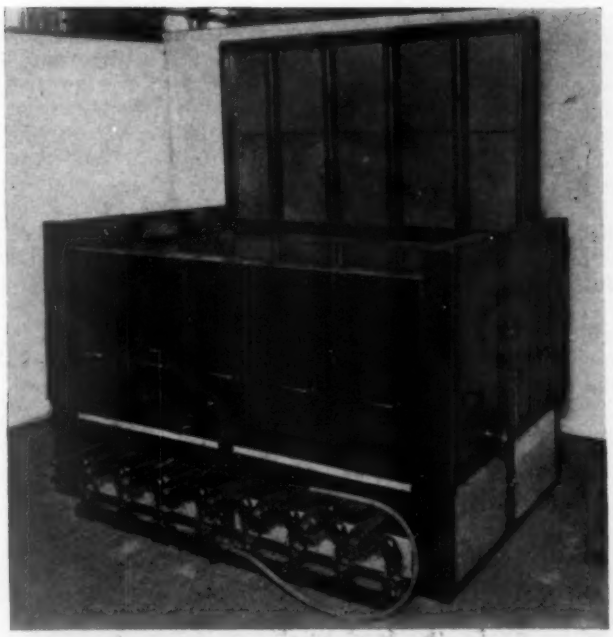
Of the total output in 1931, 1,426,908,000 gallons, or 77.9 per cent, was blended at refineries; 47,964,000 gallons, or 2.6 per cent, was run through pipe lines in California; 6,216,000 gallons, or .3 per cent, was blended at plants east of California; 178,500,000 gallons, or 9.7 per cent, was estimated as exported or sold to jobbers; 11,844,000 gallons, or .7 per cent, was added to stocks, leaving a balance of 160,486,000 gallons, or 8.8 per cent, for losses and quantities not accounted for. These data indicate principally declines in the percentages utilized by refiners, and exported and sold to jobbers, with a comparable increase in losses and quantities unaccounted for.—*U. S. Bureau of Mines*

Industrial Furnaces For Gas

XVII-Ovens in The Electrical Industry and for Heat Treating

LAWRENCE E. BIEMILLER

Supervisor Fuel Sales, Consolidated Gas, Electric Light & Power Company

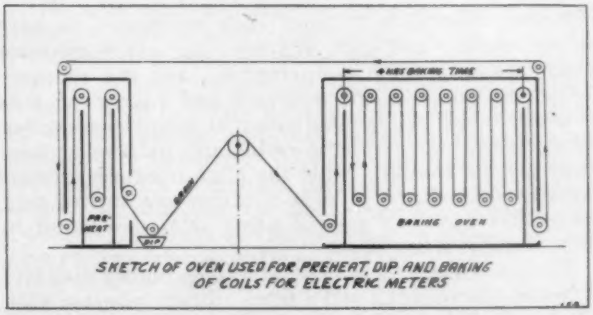


Crawford Oven for Preheating Castings before Welding

ONE of the most important of American industries is devoted to the manufacture of electrical equipment of all types. In connection with this manufacture ovens of all types are extensively used for the baking of enameled wire, of insulating varnishes and compounds, as well as the baking of metal finishes. The japanning of metal surfaces has already been extensively discussed, and the problems, and their solution, of such baking in connection with electrical equipment are similar to those already discussed. However, it will be desirable to list a few of the most important types and kinds of electrical equipment so treated. A japanned steel surface is the standard finish for control boards, motor control boxes, switch and fuse boxes. Both burn-off and japanning ovens are used, quite frequently continuous ones. Many loud speakers and cabinets turned out by the radio industry are japanned.

Baking of Armatures and Insulating Varnishes

It might be said that the two basic requirements of the electrical equipment manufacturer are a material to conduct electricity, and a material to insulate one conductor from another, or a conductor from a conducting material which is not to function as a conductor. Insulating materials cover a wide range of substances including liquids, papers, cloths and solids. One of the very common insulating materials is the insulating varnish which is a combination of gum, asphalt or resin with drying oils, drier and solvent. The insulating varnish is used in connection with the cotton, linen, and silk fabrics to produce insulating fabrics and tapes. It is also used on papers for the insulation of power cables, and in connection with coils, armatures, and fields to fill the interstices between the several strands of wire, and directly on the bare wire to produce enameled wire.



SKETCH OF OVEN USED FOR PREHEAT, DIP, AND BAKING OF COILS FOR ELECTRIC METERS

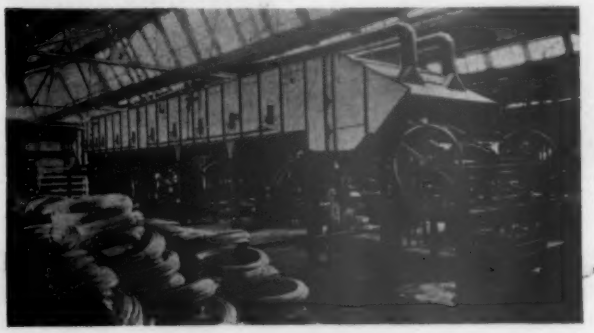
Insulating varnishes are classified as dipping and impregnating varnishes, finishing varnishes, and bonding varnishes. The chief function of the first class is that of filling the voids in the porous untreated insulating fabrics to exclude air and moisture. The finishing varnishes are used principally as a hard film to increase protection of the surface of fabricated units, while the bonding varnishes, as the name implies, are used to develop mechanical strength in a unit composed of several parts.

Clear varnishes possess greater strength than black varnishes, and so are used, for instance, on high speed armatures. Black varnishes, however, are more flexible and offer a more highly insulating film. Some varnishes are air drying, but many require oven drying. If a varnish is more quickly dried in an oven, it will have a longer life. Baking varnishes of high vegetable oil content produce films of greatest insulation value, flexibility and toughness. Electrical apparatus subject to extreme service conditions can be properly treated only with such varnishes.

The use of enameled wire makes available coils of a very much higher space factor than could be obtained with the fabric insulations. It also has a relatively high dielectric strength, good heat conductivity, and is relatively moisture proof. The process of enamelling of wire consists of the successive baking of thin coats of insulating varnish on bare copper wire. Usually three to eight coats are applied with mil increases from 0.3 to 3.0. A number of thin coats are preferable to a few heavy coats. The treating of wire with several coats of enamel is prohibitive unless the coating and baking processes are automatic.

Wire enameling ovens may be either vertical or horizontal. The vertical unit permits the varnish tank to be located beneath the oven. A shaft carrying 3 to 8

sheaves over which the wire passes, runs through the tank below the varnish level. At the top of the oven is a corresponding group of sheaves which return the wire again to the sheaves below. Thus it will be seen that the wire can be coated with varnish between each pair of sheaves, returning again to the oven. By the time it has progressed over all the sheaves it has received the desired number of coatings, each having been baked. From the oven exit the wire passes on a spool where it is wound, the entire operation being continuous and automatic. Oven temperatures usually range from 450° to 750° F, the temperature depending upon the speed at which the wire is being run through the oven. The speed of travel will depend upon the oven temperature, the length of travel through the oven, and the size of the wire being coated. The heavier the wire the slower must be the oven speed.



Continuous Oven for Tempering Springs

Temperature distribution must be as near perfect as possible. Any cold currents would slow down oxidation and drying, and allow the wire to reach the head sheave before the film is hard. The horizontal oven carries a varnish tank at both ends and eliminates the relatively unproductive travel of wire from head to tank sheave in the case of the vertical unit. However, the horizontal oven requires more space than the vertical one. In any case it is essential that the wire be carefully cleaned, and that the enamel be clean and of the correct viscosity, constitution and temperature.

Conveyor type ovens are used for drying and baking the rotors and stators of the small motors which are produced in such large quantities. An oven 31 by 9 by 18 feet, with one compartment for preheat and one for baking, has a capacity of 1200 rotors and 1200 stators per day. For handling such parts the conveyor is a double chain unit with spacer bars set on 18 inch centers, and operates at a speed of 2 inches per minute. The conveyor is loaded and unloaded at the same end.

The work first passes through the preheating compartment where it is thoroughly dried at 150° F. and made ready for the varnish. It then passes to the dipping operation where the parts are slowly submerged and allowed to remain in the varnish three minutes, then slowly withdrawn. It is allowed about 45 minutes to drain on its way to the baking compartment. The work is in a temperature of 270° F. for eight hours in the baking compartment, then is in the cooling department for four hours, by which time it has cooled to room temperature.

Another electrical product dried and baked in a continuous oven is the coils used in electrical meters. After the coils are formed and taped they are ready for the application of black insulating varnish coats. The varnish baking unit consists of a preheat oven, an automatic dip and drain section, and a baking oven. This entire unit is 34 feet long, 7 feet wide and 15 feet high. One conveyor unit passes continuously through both ovens. It consists of two matched strands of roller chain with extended pins on definite centers, supporting pipe flights from which the work is suspended. The complete cycle is nearly nine hours, of which 1¼ hours are in the preheat oven at 150° F., forty minutes of dip and drain, and four hours in the baking oven at 280° F. The preheat section is heated by direct gas burners of drilled pipe, and is vented by natural draft. The baking section is heated by a system of indirect gas vertical radiators. The gas is burnt on bar burners, and the radiators connect to a single outlet duct vented by a motor driven exhaust fan.

Another type of oven operation is the drying of core examinations. Sometimes the laminations are stamped from plant sheets and then coated, and in other cases the sheets are passed through coating rolls, which coat both sides with varnish, and then go into oven where they are baked at about 380° F.

Ovens for Motor Maintenance

Just as ovens are used in the manufacture of electrical equipment, so are they used in the maintenance of such equipment, particularly motors. Large plants have their own electrical maintenance departments, and all industrial centers have organizations specializing in this work. The maintenance of electrical machinery is principally that of repairing or replacing insulation.

When a motor comes into the shop for overhauling it is usually dismounted, the armature removed and the coils blown out with compressed air. Then the coils are tested to determine if complete rewinding is necessary. If the old insulation has not actually burnt out it is often possible to restore the coil or armature by a fresh application of properly chosen insulating varnish.

As in the case of new motors, the fabric of freshly wound coils has an appreciable moisture content. It is to eliminate this moisture that the coils are preheated to temperatures of from 185 to 275, depending upon the size of the armature or other unit, and the depth of the windings. The time of drying also depends upon the size, in the case of large car armatures being as much as 12 hours. This preheat not only eliminates the moisture, but also opens up the pores of the insulating fabric so that it can receive the maximum amount of varnish.

Particularly in the case of large coils it is important that the varnish be well baked. For large coils the time of bake may be as much as 48 hours. Due to the variety of the work, continuous ovens are not frequently used in maintenance work. Usually batch type ovens are used, into which an armature or coil may be placed. If small, it may be manually placed on an oven shelf or the oven floor; if large, it may be rolled in on a truck or car, or carried in suspended from an overhead trolley.

Ovens for Molded Insulation

Molded insulation includes such substances as hard rubber, shellac and gum mixtures and pitch mixtures which soften at high temperatures; and the synthetic resins, portland cement mixtures and silicate of soda mixtures which are non-softening at high temperatures. Hard rubber, the synthetic resins and the shellac mixtures are hot molded, while the pitch mixtures, cement asbestos, and silicate of soda mixtures are molded cold, the excess water or solvent being later driven off by heat, usually in an oven.

The pitch mixtures consist of a pitch binder dissolved in benzine or naphtha and a filler, usually asbestos fibre. They are molded and then baked in an oven to drive off

the solvent and harden the mass. Ovens for baking of cold molded insulation are built with special facilities for ventilation due to the inflammable nature of the solvents used. The baking range is from 300° to 400° F. and the baking period from 16 to 24 hours, depending upon the size of the article being made. This type of insulation is especially adaptable to plugs, sockets and small fittings not subject to high operating temperatures.

Ovens for Low Temperature Heat Treating

For some time, ovens have been used for very low temperature heat treating such as tempering, which is done at temperatures from 200° to 600° F. While ovens can be used for all types of products, they are particularly advantageous in the case of light yet bulky objects, such as springs. In such cases they will eliminate expensive handling and reduce the floor space required to a minimum. They may also eliminate certain cleaning and drying operations which are necessary if the tempering is done in liquid baths. As in the cases of ovens for other operations, continuous ovens can be used if production warrants, and if not, batch ovens can be used.

The annealing of aluminum at temperatures around 900° F. can be done in ovens. There is an increasing tendency to demand that iron and steel castings be annealed. Much of such annealing is done at temperatures which permit the use of ovens. Since a very even heat distribution is necessary, it is easy to justify the use of a well designed oven with a flexible and easily controlled fuel.

Oven manufacturers are constantly developing new designs of ovens for specialized requirements in the heat treating field. The welding of motor blocks, and similar castings, especially of aluminum, has presented difficulties due to warping of these pieces when they are not uniformly heated during welding operations. With temporary brick furnaces, the heat distribution is poor, and undesirable drafts are set up by the holes through which the welder attempts to work.

To fill this need the Crawford Welding Preheater was developed. As will be seen from the photograph herewith, the equipment is built in two sections; a burner section below and a heating chamber above. In the former are eight Multi-tube gas burners. The upper section is built with sliding doors, front, back, top and at each side. Through these sliding doors any part of the work can be reached by the welder from any position, using a minimum opening and eliminating cold drafts on the casting. The entire top is hinged and can be opened in order to load and unload. The weight of the casting to be welded is held above the heating chamber on cast iron grate bars.

In the welding of a heavy aluminum casting, it is put in the oven, and the latter closed, and heated to a temperature of 900° to 1000° F. in an hour. When this temperature is reached, the sliding door nearing the break is opened and the welder completes the weld. Then the oven is closed and the cooling of the casting permitted, at a desired predetermined rate, by controlling the amount of gas on the burners at all times. After it cools to between 500 and 600, all heat is turned off and the casting is allowed to cool to room temperature, still in the oven. The welding temperatures are 900°-1000° for aluminum, and 1100° to 1250° for cast iron. The total cost for labor, fuel, and welding materials will run about $13.00 to repair an aluminum crank case costing from $200.00 to $275.00.

An entirely different type of heat treating operation performed in a gas oven is the heat treating of zinc slabs. Due to its low melting point, zinc is malleable only with a small temperature range, so a well designed oven, with a flexible easily controlled fuel, is required to deliver the slabs to the rolling mill at the exact desired temperature.

These are just a few of many examples possible, of the ever increasing use of gas ovens in the heat treating field. With the trend to a growth in the number of materials which receive heat treatment at low temperatures, it is probable that this represents one of the most important future fields for well designed gas ovens. These must be heavily insulated, with nearly perfect heat distribution and a temperature exactly controlled, combined in some cases with forced ventilation or recirculation.

(Continued in an early issue)

Our Lawful Right to Merchandise Appliances

THERE is no question but what the utilities have the lawful right to merchandise appliances. The courts have even declared that it is their duty to furnish their consumers with efficient appliances. It is un-American to attempt to take from anyone the right to engage in a lawful business by a legislative fiat merely in the hope of diverting his business to a competitor. Does it not seem ridiculous for a Legislature to say a gas and electric utility, trained and skilled in the handling of these commodities, that it may not engage in the merchandising of appliances utilizing gas and electricity, and on the other hand proclaim that it is lawful for a department store to sell gas stoves and electric heaters as a side line to lingerie, dry goods and jewelry? I imagine that the newspaper men of this country would feel outraged, and justly so, if the Legislature should say to them that they must no longer engage in job printing or in the engraving business, but must turn this business over to the stationery department of the chain store.

It is unthinkable that the Legislatures of this country, especially now that they have had the experience of the Kansas and Oklahoma laws behind them, will entertain in the future any further attempts to cut away from the utilities the very foundation upon which their business has been builded. To deprive the manufacturers of appliances of their most valuable outlet; to take from the newspapers one of their great sources of advertising revenue; to deprive the general public of the opportunity of buying gas and electric appliances from the concerns who are best equipped to handle and service them, when the net result of such a policy is to deliver the great bulk of such appliance business as is left into the hands of the mail order houses and chain stores, flooding the public with cheap, uneconomical and often dangerous types of appliances.

We in the utility business are naturally alarmed over this unfair attack upon the very heart of our business, and if we alone would be the sufferers from this ill-advised legislation, it is very possible that we would be charged with selfishness in our attitude. But the Anti-Utility Merchandising Legislation affects so many industries and so many people that we feel we have a common cause with the majority of the people of this country, and we appeal to you gentlemen, as the moulders of public opinion, to use every facility within your power to advise the people of the communities served by you of the results that will flow inevitably from the adoption of this vicious type of legislation.— *Leroy M. Edwards, before Convention of National Editorial Assn., Los Angeles, 1932.*

Watch Your Step!

HARTLEY G. WALKER

President, Pittsburgh Water Heater Company

Let's Go!

OWING to the remarkable growth experienced by both natural and manufactured gas companies during the past ten years, the personnel of the Gas Industry has apparently come to believe that this growth can be expected to continue and be equalled or possibly surpassed during the next ten years, and the tendency of the Industry has been to regard the loss in the number of customers and in revenue per customer during 1931 and 1932 as a temporary condition due entirely to the Depression. While this loss in revenue has undoubtedly been due in some measure to the effects of the Depression, most Gas Company Officials have, I believe, been too prone to blame all of their troubles on the Depression, and to expect that when the Sun of Prosperity shines again that the Gas Industry will continue to advance without any effort on the part of the Industry to face its troubles and solve its problems.

Breakers Ahead

There are a few Gas Company Officials who seem to appreciate that there are breakers ahead in the form of new competition which may undo all of the gains made during the past ten years. Mr. Thomas F. Kennedy of Henry L. Doherty and Company, in his admirable address, "The Trend of Competition upon the Gas Industry" before the Pennsylvania Gas Association Meeting at Galen Hall in April, seems to be fully alive to the difficulties ahead, but so far as I can determine, his voice seems to be a lone cry in the wilderness so far as the rest of the Industry is concerned.

Too many Gas Company Executives, I believe, have decided that a yearly increase in both meters and revenue is their God-given right and they have been too complacent to know that this is a period of change and that no Industry, no matter how well capitalized, if it does not face the facts with regard to competition and devise ways and means of defeating this competition, can survive.

Instead of this, the Gas Company Executives, during the past eighteen months, have in many cases deliberately proceeded to break down the one method which they have of meeting competition, i.e., their New Business Departments. Most Gas Companies' New Business Departments lose money. In addition to this, the stock of goods on hand and the money tied up in Accounts Receivable represent considerable investments, and with the pinch of falling revenues and the difficulty of securing additional capital, due to the present condition of the Securities Market, a great many of the Gas Company Executives have taken the easiest way out; that is, curtailing, and, in many cases, practically discontinuing their New Business Departments on the assumption that people have to use gas for fuel and that consequently, their New Business activities are simply a source of expense or loss and are, therefore, unnecessary.

Nothing could be further from the facts. Nearly all gas men are familiar with the plans being made by the Electric Industry to capture the cooking load, and also the plans being made in some territories by the Electric Industry to secure the water heating load. I believe that very few gas men, however, are familiar with the fact that the Electric Industry is now in a position for the first time to go after electric house heating business. The Westinghouse Electric and Manufacturing Company has developed a new air conditioning and house heating unit, which, so far as house heating is concerned, adopts an entirely new principle, which, for the first time, will enable the Electric Industry to invade successfully the house heating field.

This new unit involves the use of the principle of "reversed refrigeration." An air conditioning installation is required in summer to absorb in pickup coils the heat that is within the house, and pump it to radiators or other coils where it can be dissipated out of doors, just as the refrigerator picks up the heat that leaks into the food chamber and radiates it into the room atmosphere. In winter, the direction of flow is reversed in the Westinghouse system, so that the equipment picks up the heat in the outside atmosphere and brings it inside to warm the house. It seems a paradox to get heat from the cold outdoors to warm a house. The explanation is that the atmosphere is only relatively cold. Even zero Fahrenheit is some 460 degrees above absolute zero. An experimental installation at Reading, Pennsylvania, heated an ordinary frame house satisfactorily in zero weather. Efficiency is rated as 3 to 1 to 5 to 1; i.e., current consumed produces three to five times as much house heat as if electricity were directly converted into heat. It can easily be seen that the development of this machine has the effect of reducing the cost of electricity for house heating to a point from one-third to one-fifth under present rates

and for the first time puts electricity in direct competition with gas for house heating on an actual cost or dollar for dollar basis.

Coal and Oil—Real Competitors

It is my opinion, however, that the real competition in the Gas Industry is not coming so much from the Electric Industry as from the Coal and Oil Industries. It has been the fashion in the Gas Industry to sneer at the coal dealer and his lack of progress. Few Gas Company Executives seem to realize that the coal man of the 1920's and the coal man of the 1930's is a different person, so far as merchandising ideas are concerned. There has been a tremendous improvement in the methods of burning coal for domestic purposes. The development of small size stokers for domestic use has been phenomenal, and several concerns are now offering domestic stokers to the small or medium size home owners. In the City of Pittsburgh, despite the fact that Pittsburgh is served by 61 cent 1100 B.t.u. gas, over 600 domestic coal stokers have been sold by one manufacturer during the past year. These stokers sell for about $300.00 apiece, and must in each case represent a loss in revenue to local Gas Companies of at least $300.00 a year, or a loss in revenue in the City of Pittsburgh alone through the activities of one stoker manufacturer of over $180,000.00 a year.

This phenomenal development in small size stokers probably means that the Gas Industry has lost forever its opportunity to secure the house heating load in small apartments and large residences, and it is only a question of time until simpler and lower priced stokers begin to replace conversion burners and straight gas fired installations in the smaller and lower priced residences.

With regard to water heaters which the gas men have always considered as their particular appliance where no other fuel could compete, all of the inventive genius which has been applied to automatic gas water heaters in the past twenty years has been matched by equal developments in the coal water field. Coal water heaters are now available which are equipped with magazine feeds, draft controls and operated on a thermostatic principle and which are much more automatic in operation than a gas side arm tank water heater and which are offering severe competition to the standard type of automatic gas water heater.

Let me quote from an article in "Business Week" in a recent issue concerning the activities of the coal dealers on a new coal water heater; "Gas long ago threw anthracite out of the kitchen and more recently has tried to drive it out of the cellar, with elaborate sales campaigns for gas house heating. Anthracite has found a new way to retaliate, and this week the Anthracite Institute announced its members would actively promote the sale of the Bengal water heater, made by the Floyd Wells Company. Tests by the Institute's laboratory showed the heater would supply hot water for the average home with a consumption of a single ton of chestnut or pea coal from May to October. It is thermostatically controlled, to give water of even heat, and has a magazine feed feature, so that it required attention but once in twenty-four to twenty-eight hours. The price runs far below prices previously asked."

An Insulated Coal Range

In addition to the remarkable progress in the coal-water heater field, an insulated coal range has been developed, which, while it is still in its infancy will, I understand, offer real competition to gas in the cooking field. So much for the Coal Industry and what it is doing to encroach on the gas load.

Now let us consider the Oil Industry. The sale of oil burners for house heating has, of course, been one of the most spectacular merchandising jobs of the last decade. More recently the Oil Burner Industry has developed small conversion burners which fit into coal or gas ranges and burn a light grade of fuel oil. During the last year, more than 300,000 of these burners have been installed in the United States, the majority of them being installed in the New England territory. I recently went through a Factory in Detroit which was engaged in the manufacture of this kind of equipment, and the Officials of this particular concern told me they confidently expect sales of over 300,000 burners in 1932, the so-called "Depression Year" when the sale of gas ranges has been the lowest in twenty years.

The automatic oil water heater has now passed the experimental stage and is capable of giving practically the same service to the customer as will an automatic gas water heater. It is equipped with a thermostat, safety pilot and all the other devices that may be found on an automatic water heater, and in certain areas, these water heaters are being merchandised aggressively, both by the manufacturers' agents and the oil companies.

Even the gas refrigerator, of which the Gas Industry is justly proud, has its counterpart in the oil fired refrigerator which is being offered by the leading Mail Order Houses and which is going to offer competition to gas refrigerators, especially in territories where the gas rates are high.

The large Oil Companies have recognized this growing demand for oil burning appliances and are constantly experimenting in an effort to produce better fuel oil. Let me quote from an article appearing in the "New York Times" on Sunday, August 14, on the Standard Oil Company of New Jersey's new Hydrogenation Process: "A superior Kerosene has been produced. It may be surprising to know that the demand for kerosene was so great at one time during the past year that the company was obliged to turn its hydrogenation plant over to the exclusive manufacture of this product for five straight months, supplementing the regular refinery output. Widespread growth in the use of range oil burners is believed to have been the major factor influencing this increase in kerosene demand.

Question of Rates

Nearly every gas company now has a rate fight to contend with, and while it is true that in many cases the existing rates do not return a fair revenue on the investment, this is not going to satisfy the Public. With the rapid fall in the prices of all commodities, the Public feels that the price of gas also should be reduced in accordance with the present day tendency. Every gas man knows that the question of rates at which gas can be sold is absolutely tied up to consumption, and that if consumption could be increased, rates could be correspondingly reduced, but in spite of this, the great majority of the gas companies have adopted the policy of restricting New Business activities because of rate disputes, when all the Officials know very well that the only way that gas rates can be reduced is by encouraging the sale of gas burning appliances so that the consumption can be increased.

The folly of this policy seems to be one of the principal mistakes which the Gas Industry is making at this time. For some reason which has never been

clear to me, the higher Officials in most gas companies seem to think that in some way New Business activities set up ill feeling on the part of the Public; whereas, as a matter of fact, the activities of the New Business Department are the only means which the Gas Company has of directly contacting its customers and building good will for the future.

On top of all of this, the Gas Industry is not like the manufacturing business, which can take a reduction of fifteen to twenty-five per cent in its sales and still cut expenses so that it can operate at a profit. The greatest portion of gas company expense is made up of fixed charges, consisting of depreciation on its investment, bond interest, taxes, etc., which cannot be reduced, and unless the Gas Company Executives look ahead and do something to counteract this condition, they will find themselves with a reduction in net revenue of from twenty-five to thirty per cent, and with the present tendency towards rising interest rates, they will find that their fixed charges have increased.

When this condition takes place, as it inevitably will unless something is done about maintaining the present load and increasing it, the stock of the majority of the gas companies will fall in value, and in many cases, the bonds will be equally affected, because no matter what money is invested in a business, if the business cannot earn a profit, the capital has been lost.

Frankly, the outlook is not a pleasant one, and unless the Industry takes immediate and radical steps to recover some of the load which has already been lost and secure additional revenue from new sources to balance that portion of the load which is gone forever, the result will be damaging.

Situation Not Hopeless

However, the way out of the Depression for the Gas Industry is not a hopeless one, but it will require thought, plenty of hard work and the investment of some capital. It means, first of all, more and better paid salesmen—not fewer salesmen with lower wages. It means better analysis and understanding of the selling problem where the sale of gas appliances is concerned. It means the adoption of a dealer cooperation plan designed to sell more merchandise, not the turning over of sales to the dealers, as so many cooperation plans have meant in the past. It means the adoption of promotional rates which will assist in the sale of appliances, and it means, most of all, that the higher gas company officials will have to put more time and thought on methods of selling more gas, instead of leaving this problem largely to the commercial managers, as in the past.

The commercial manager is not to blame for present day conditions in the Gas Industry. In most cases, he has very little authority. In addition to this, during the past two years, his budget for advertising, salaries and commissions has been constantly reduced by his superiors, who have looked on his Department simply as a troublesome source of expense.

The question as to whether or not the gas company's earnings, property value and bonds will go the way of the street railways' properties, depends upon the management of the gas companies themselves. The street railway companies did little to save themselves from disaster, and as a result, disaster overtook them, just as inevitably it will overtake the Gas Industry, unless we have a sudden awakening of the Gas Industry from its present state of lethargy.

Many gas men will probably disagree with me when I say that it is easy to run a gas plant, just as it is easy to run a factory, providing you have the orders to keep the factory going. It does not matter how modern a gas company's equipment may be, nor what savings the gas company may make from the operating end of the business, if the gas company cannot sell its product, it cannot exist, which is a fact which seems to have been forgotten by many gas company executives.

Of course, it is easy to criticize, and no criticism is of any value unless it offers constructive suggestions as to how to overcome the evils which it points out. At the same time, when considering the selling problem, this is what the Gas Industry faces. It is extremely difficult to lay out a selling plan and say that this is the right plan and that no other plan will succeed. This is particularly the case, because of the fact that in selling, as in most other lines of endeavor, there is no substitute for thought and hard work, and these are two factors which have not been applied by the higher officials of many gas companies when they have come to the question of gas appliances. Too often in the past, all the thought on how to sell gas appliances has been left to the commercial manager, and when he has offered a suggestion, the mental attitude of his superior has very often been that this is some new scheme that should be turned down.

There are, however, certain essentials which apply to every city and territory and there is, therefore, a certain pattern which should be followed on all commercial activities, and it might be well to outline these factors at this point.

Importance of Selling Personnel

The first and most important factor in any Sales Organization is the personnel. The Sales Forces of nearly all Gas Companies are now undermanned. I know of few Gas Companies who do not need more salesmen and better salesmen, and I believe that every Gas Company should have at least one salesman for every two or three thousand meters, and possibly one salesman for every thousand meters in the better territories.

Secondly, the salesmen should be armed with a Sales Plan which will enable them to sell and to sell in reasonable quantities. This means merchandise at the proper price. It means the proper terms, and in the case of some particularly good load building appliances, it may mean going as far as offering the appliance on terms which are extended over so long a period as to mean practically a rental plan. In other words, whether it be water heaters, gas ranges, house heating refrigerators, space heating, or any other form of appliance which will produce increased revenue, the appliance should be offered on a basis which will cause the Public to purchase the appliance readily and in quantity.

Thirdly, the problem of dealer cooperation must be approached on an altogether different basis than in the past. Most dealer cooperation plans in the past have been designed to accomplish one of two things—either the Gas Company has set itself up as a wholesaler and has tried to allot itself all of the appliance business, or it has adopted the policy of offering the dealer some form of cooperation which is not attractive to the dealer, and consequently, no sales have resulted. In other words, no effort has been made to determine what the dealer needs to sell more gas appliances. There have been some rather notable exceptions to this rule which indicate what can be done if this problem is approached in the proper manner, but these exceptions apparently still remain exceptions, because very few Gas Companies have adopted the lead of the Companies who

have approached this problem in the proper manner.

The principal problem which the dealer has to face is the financing and collection of accounts. Strange to say, this problem becomes much more acute as prices fall. When a dealer sells a high priced appliance to a customer who buys high priced equipment, the customer generally either pays cash, or, if he does purchase on the Time Payment Plan, the sales are generally so large as to make the cost of collecting a negligible factor. However, with the constantly lowering prices of all kinds of gas appliances, the unit of sale has become smaller and smaller, and consequently, the monthly collections have become smaller and smaller—at least, in the case of gas ranges and water heaters, the monthly payments have become so small that the cost of collection runs in most cases as high as five or six per cent of the total cost of the appliance without giving any consideration to the cost of financing.

In addition to this, the most fertile field in the sale of gas appliances where the Gas Company needs the activities of the dealer the most is in the smaller towns, and in these territories, the dealer is generally unable to handle the financing himself, and he has to discount his time payment paper either with the manufacturer who supplies him with goods, or with a Finance Company. Since these small dealers are generally not in good financial shape, the manufacturer or Finance Company generally prefers to collect the accounts direct, and this sets up a condition which is extremely costly from a collection standpoint.

Handling Accounts

However, there is no way out for the Manufacturer and Finance Company, unless the Gas Company will step into the picture at this point and take over the financing and collecting of accounts. A number of objections to a move of this kind have been invented by gas officials who simply do not want to bother with anything that might mean more work for any one in the Gas Company. These are that the Finance Company might object to the Gas Company's acting in the capacity of a Finance Company and that the Gas Company is likely to have some loss on credit risks on sales of this kind and that collections of this type are going to cost the Gas Company some money for additional clerical help.

What if all these things are true? If the Gas Company wishes to placate the Finance Companies, they can easily re-discount the paper with them. As to the objection with regard to the possibilities of the Gas Company's having some loss on credit risk, what of it? The sale of load building appliances can be increased through a move of this kind, and in what better way could the Gas Company spend its money to promote business than by assuming some of these credit losses, which, incidentally, will be much smaller than most Gas Company Officials seem to think? With regard to the clerical expense necessary to make collections, the same thing applies. In the first place, if the Gas Company is already merchandising, it is engaged in the collection of monthly payment accounts, and the addition of more accounts will represent very little additional expense. I have no data as to the collection losses on gas ranges, gas refrigerators or appliances of this sort, but the loss on water heaters is between one and two per cent of the amount of the sales, and since a water heater, in most cases, represents an increased gas load which will pay for the water heater in two years, this means that the loss of credits where a Gas Company finances the dealer would not be greater than four per cent of the increased load secured from the appliance during the first year that it is installed. I think that few Gas Company Executives will deny that they would be glad to make any move which would increase the gas load at a cost of only four per cent of the first year's revenue.

There are many other plans which should be applied to the sale of gas appliances. By the Gas Company's attitude that they will only put appliances into homes where the appliance has actually been sold and purchased, either for cash or on a time payment plan, they automatically debar themselves from selling appliances in any rented residence, which means at least forty per cent of the potential market in most communities. Why should not the Gas Companies, now that they are confronted by all kinds of new competition return to first principles and offer water heaters, gas ranges, conversion burners, etc., on a rental plan? This would give them an opportunity to enter the great unsold market which is represented by the people who live in rented homes? Some Gas Companies are doing this with considerable success, but the great majority of them, when it is suggested they offer appliances on a rental plan, throw up their hands in horror, for no good reason they can think of, except that they never made such a move before.

Let the President, the Vice-President and the Managers of the Gas Companies start to demand more sales and new sales plans and unusual offers from their commercial managers, and let them instruct their commercial managers to put on more salesmen and have larger advertising budgets and easy terms. In other words, let the Heads of the various Gas Companies show their Commercial Managers that they are really taking an interest in the Commercial Manager's Department and expect him to make a showing and the Gas Industry will easily defeat the new competition that faces it.

Faraday's Original Laboratory Reconstructed

A RECONSTRUCTION of Michael Faraday's original laboratory was on display in the showroom of the Milwaukee Gas Light Company during a recent Faraday refrigerator sales campaign. The accompanying picture shows the laboratory and a number of company officials. From left to right they are: H. J. Dropp, commercial engineer; R. O. Jasperson, new business manager; G. A. Trestor, advertising manager; C. L. Brashear, manager refrigeration department and Adam Ott, sales promotion department.

It Pays to Harness All Available Resources in Building Domestic Revenue

R. E. FISHER
Vice-President, Pacific Gas & Electric Company
San Francisco

IN these unusual times "business may be hard to get, but it can be had." The truth of such statement can only be verified by facts. Pacific Gas and Electric Company, one of the foremost utilities in the country, has been able to demonstrate the truthfulness of such a statement during the past eight months.

The results of the Domestic Gas Load Building Program of this utility has exceeded all expectations. The success of this program in a so-called depression period is due primarily to two things: First—to a United Industry under the leadership of the Pacific Gas and Electric Company and, Second—to a well trained sales organization backed by the enthusiastic cooperation of all employees of the Company.

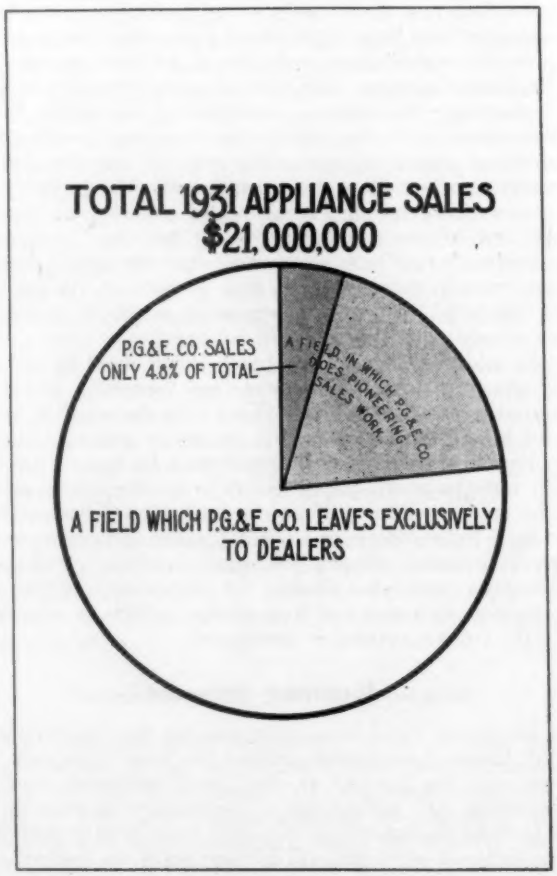
Without a doubt the cooperative relationship which exists in this united industry between the utility, dealers and manufacturers and which has been tried and tested over a period of more than 25 years, has no parallel or precedent in this country.

The Utility Must Pioneer

Pacific Gas and Electric Company has long recognized the dealers as natural allies and feel that they fill an existing demand but on the other hand, they believe the utility must create the demand by introducing, proving and pioneering new appliances as well as devoting time and money building new and extending present markets.

The utility's first obligation is to the public to see that they, its consumers, are advised of the latest developments in proven gas appliances in order that they may enjoy the greatest conveniences and comforts of gas service. By the fulfilling of this obligation in every way, the utility builds up the community in which it is operating, and by building up the community it increases prosperity. Increased prosperity means increased service. Increased service results in greater sales and the greater the sales the lower the rates which the consumer enjoys.

A program to increase sales which would be conducive of a lower rate base must be designed to accomplish two things: First—to load existing production and distribution facilities; Second—to increase load factor.


TOTAL 1931 APPLIANCE SALES
$21,000,000
P.G.&E. CO. SALES ONLY 4.6% OF TOTAL
A FIELD IN WHICH P.G.&E. CO. DOES PIONEERING SALES WORK
A FIELD WHICH P.G.&E. CO. LEAVES EXCLUSIVELY TO DEALERS

Existing production and distribution facilities may be loaded in three ways; namely:

1—By the Utility
2—By the Dealer—or
3—By a United Industry

Pacific Gas and Electric Company feels that only through a united industry under the leadership of the utility, can it ever hope to attain the highest degree of sales saturation in a domestic load building program.

Consequently, the Pacific Gas and Electric Company does not merchandise in the strictest sense of the word but devotes its effort to the building of public acceptance and the development of new markets. When this acceptance is thoroughly built for any appliance, its actual selling is left to dealers where they will aggressively carry on.

The accompanying chart shows the limited way in which the Pacific Gas and Electric Company sells appliances direct. The complete circle represents the total retail merchandise volume of gas and electric appliances sold during 1931 in the territory served by the company. Of that business the unshaded section is left exclusively to the dealers and no sales are made by the Company in that appliance field. The shaded section indicates the limited field in which the Company does creative pioneering market developing work. It was the appliances in this section that do not enjoy a general public acceptance and which are consequently not generally viewed as satisfactorily profitable by deal-

ers. If the company were to discontinue its sales activity in this field, undoubtedly dealer sales would immediately decrease.

The cooperative policy is printed and continually brought to the attention of all dealer allies and therefore lends itself literally to the stimuation of active dealer participation in aggressive seasonal sales campaigns.

Examples of Effective Cooperation

Examples of the effectiveness of the cooperative movement between the utility and dealers by building a domestic gas load which might be mentioned are the "United Industry Automatic Water Heater Campaign" and the "Summer Gas Load Building Campaign," both of which recently closed with most astonishing results.

The Automatic Water Heater Campaign was probably the most successful drive ever conducted on the Pacific Coast and is particularly outstanding in that it was conducted during a period when business generally was at its lowest ebb. It took, however, a united industry to accomplish such a tremendous selling job. The entire gas industry was mobilized with carefully prepared sales and advertising plans. Dealer meetings were held for the setting of quotas, fixing of uniform terms on a more liberal time payment basis so that the entire industry could be in accord.

The campaign was supported by the largest advertising budget ever devoted to a single activity by the Pacific Gas and Electric Company. Included in this budget of advertising were broadsides to the dealers encouraging their participation, consumer broadsides, employee broadsides, newspapers, bill boards, truck banners, and special window displays. All advertising invited the public to see their dealers or the PG&E.

The campaign was opened with a quota of 8,000 automatic water heater sales and installations. Special terms were given with down payments as low as $4.85 and monthly payments extending over a period of 12 to 30 months. No payments, however, of less than $3.40 per month were acceptable. Trade-in allowances were offered in the amount of $5.00 for a tank heater, $7.50 for a combination non-automatic storage heater and $10.00 for a water back or competing fuel heater. Pacific Gas and Electric Company confined its sales to replacing other fuels and non-automatic water heaters in all metropolitan areas in which territory 90% of its consumers are located. New homes and the replacement of existing automatic water heaters was left to the dealers in this particular area.

A Very Successful Plan

The "15 and 1 Selling Plan" which was inaugurated by A. C. Miller, Domestic Gas Sales Engineer, proved extremely successful. Lists were made up by the Sales Department of consumers then using non-automatic water heaters or those using other fuels for heating water. These lists were made up from previous surveys. Direct-by-mail broadsides were mailed to each of the addresses on the survey list four days prior to the time the list was given to the salesman.

These lists were typed on a special form for the use of the salesman making calls. Each day the salesmen were given a new list of 15 names, and addresses. It was the duty of the salesman to call on these consumers during the forenoon, the object being primarily to develop interest and prospects; also to obtain an appointment to call back at a definite time, preferably in the evening to close the sale. Information received from the call was indicated in a space provided on the survey list. The salesman made his own record of prospects developed after indicating them on the survey list and when the prospect was sold it was reported to the Sales Department to be withdrawn from the prospect list.

Each salesman was instructed to call back on one previous sale or user of an automatic water heater each day. This was to obtain additional prospects and also to insure consumer satisfaction with new installations. This selling plan was to be used the first 5 days of each week, Saturday being used for follow-up and closing interviews. Survey calls were to be made each day and not accumulative.

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STATEMENT OF
PACIFIC GAS AND ELECTRIC COMPANY
APPLIANCE SALES POLICIES

First adopted in 1925—First published in 1927.

We believe that the public must be served.

That best public service can only come from a united industry, composed of the utility, appliance manufacturers, jobbers and dealer trade.

That an organized effort by the entire industry is essential if the maximum amount of business is to accrue to each group through creation of consumer acceptance of our products.

That such a united industry can and will successfully compete with other organized industries to the end that a fair share of the public buying power will be obtained.

That it is the **duty** of the utility particularly to do pioneering selling in that appliance field where there is no public demand or due to special conditions no adequate retail profit for creative and aggressive selling by retailers.

That the utility, in addition to supplying quality service at fair rates, assume leadership in the sale of quality appliances at established retail prices, adhering to ethical, constructive merchandising methods on a basis that will encourage the activity of all legitimate retailers.

That such ethical leadership has stimulated and will continue to stimulate public buying of appliances, installation work, and general supplies.

That it is the desire of the Pacific Gas and Electric Company to continue encouraging as many legitimate retail appliance dealers as can economically operate; to co-operate with such natural outlets by financing and executing constructive educational selling and advertising campaigns.

That merchants and dealers can and should retail appliances at prices fair to themselves and the public by such methods as have been found to be sound by successful retailers.

That the manufacturers and jobbers can best contribute to this plan by supplying well advertised merchandise of unquestionable quality at prices which permit the seller a legitimate profit margin.

The Pacific Gas and Electric Company will continue:

To keep an open mind. To be guided by facts. To hold out to all groups the right to full discussion. To hold to those policies we believe to be right but to quickly concede where we find we are wrong.

PACIFIC GAS AND ELECTRIC COMPANY

P · G · and E ·

Owned · Operated · Managed by Californians

Unlike a "cold canvass job," the salesman knew in advance the name of the person upon whom he was calling which was found to give PG&E salesmen considerable advantage over other salesmen in that it had the effect of making the interview more important to the consumer.

Crew Captains were held responsible for the strict observance of the plan. Special awards were presented to the Crew Captains whose crew—first, attained their quota and secondly, insisted that their men adhered to the "15 and 1" selling plan.

A Novel "Stunt"

To develop interest among salesmen and secure their interest in the campaign each salesman was furnished with a black necktie which he was to wear every day, beginning with the first of each month and until three sales had been made after which the salesman could flash out in any other color necktie he might choose. This feature proved to be very effective inasmuch as the non-productive men were singled out for more or less friendly criticism by all other employees.

(Continued on page 44)

As the Gas Company and Manufacturer Executives View the Situation

Present-Day Needs

GEO. B. CORTELYOU

President, Consolidated Gas Company of New York

REPORTS of manufactured gas companies indicate that the industry is holding up well in the face of generally adverse conditions. This gratifying evidence of stability should not, of course, blind us to the necessity of continued and renewed efforts to combat the forces of depression. One of the most effective weapons in the fight is research. Research is the industry's right arm.

If necessity is the mother of invention, depression stands in much the same relation to research; for it is in times of depression that, finding the old and accustomed methods less and less resultful, men are forced to develop new methods, new machinery and new ideas with which to keep the wheels of industry turning, even at a reduced rate. Any business that falls behind the procession of its competitors at such a time will almost certainly never catch up; and it will fall behind if it neglects the opportunities that research offers.

Research activities in the field of industrial gas utilization in the past year or two have produced results comparable to those of any similar period in the past and warrant the confident belief that gas will play an increasing role in this field, due to its low cost, efficient application and automatic control—advantages which the depression has accentuated. The Industrial Gas Research Committee of the American Gas Association has done and is doing notable work for gas utilization, as a long list of specific applications and installations is eloquent proof. The gas industry will not only benefit from a revival of industrial activity but by improving the old and developing new and more efficient equipment and processes will contribute largely to such revival.

The Stability of Our Industry

CHAS. M. COHN

Vice-President, Consolidated Gas Electric Light & Power Company of Baltimore

ANY gas executive, any investor in the securities of gas operating companies, and any householder who looks to his local gas company for dependable service at reasonable cost cannot fail to be impressed with the stability of our industry under adverse economic conditions.

Not so spectacular perhaps, as some of the other industries which swell to abnormal proportions during boom eras; but not flat on its back during lean years, either.

That the gas operating utilities have their troubles today is undeniable. Dealing with millions wholly or partly out of work, whose family incomes have undergone drastic reduction, their collections have suffered greatly. Taxes of all kinds have risen and probably will continue to rise. Ardent advocates of new and untried methods of regulation which involve discarding basic elements in our national legal structure, are actively endeavoring to capitalize on the widespread unrest. Decreased purchasing power of the nation has affected appliance sales, and the industrial use of gas has necessarily decreased.

But the thoughtful man is not deceived by these ailments, which are minor as compared with those afflicting many other industries. Gas is flowing in the mains and many cities are noticing evidences of increased consumption on the part of domestic consumers who recognize, as the merchant says, the "real value" in gas usage. A survey of the operating statistics of all manufactured gas (only) operating companies in cities of 200,000 and over shows that while 1931's aggregate gross revenue was 6½% lower than 1929, the combined net earnings of this group of utilities decreased less than 2%. During the same period the aggregate surplus of these companies increased materially.

The economic depression from which our country is now emerging is said to be the worst in our history. No doubt each such period seemed to be the worst at the time, but the 1929 catastrophe has certainly been sufficiently acute and extensive to jar even the most confirmed optimist. If during such a period our industry can continue to render good service to its customers at the lowest rates since its beginning, withstand the ravages of the depression that have appeared in many guises, and still make a creditable showing in its operating statements, an exhibition of soundness and stability is furnished which is at once impressive and convincing.

On top of all comes every indication that even a better day is coming for the gas companies. Constantly the use of hot water is growing in our family life, home cooking is coming back into favor, the finest form of househeating ever developed is operated off the gas mains, while in industry gas has proved its worth in a thousand ways. Gas refrigeration is increasing daily; and air conditioning by gas has already lifted itself above the economic horizon. If any gas man needs inspiration today, he has only to consider the vital elements of his industry, some of which have been sketched in these few brief paragraphs.

Looking Ahead

BERNARD J. MULLANEY

Vice-President, The Peoples Gas Light and Coke Company

THE Peoples Gas Light and Coke Company is ready to push ahead to new send-out records as soon as business resumes its normal forward pace.

On October 16, 1931, natural gas from Texas was added to the city's manufactured gas supply, increasing by approximately 50 per cent the heating value of the gas supplied, and making possible a general reduction in domestic rates, in addition to sales-getting reductions for industrial and commercial uses.

At the time of the change-over to the mixed gas, the appliances of all customers were put in first-class shape, regardless of former condition and without charge to the customer. This general re-conditioning of appliances has resulted in a new high average of efficiency, and the importance of this factor in good customer relations is axiomatic in the gas industry.

At the present time, aggressive sales effort directed at certain large-volume markets is showing that sales can be made in spite of the business recession. Really significant strides in these markets can be expected with a return of confidence, and the current business upturn is justifying this expectation in some measure.

Although Good Will does not appear as an asset on the company's balance sheet, it constitutes a valued resource. It is the cumulative result of years of square dealing and sincerity in service. It opens the door to new markets, and to the realization of the company's goal—to serve more completely.

What's The Outlook for Gas Refrigeration in 1933?

F. E. SELLMAN

Vice-President, Electrolux Refrigerator Sales, Inc.

WE in the refrigeration business have become so used to sales increases when almost every other kind of product was showing decreases, that we have more or less come to regard the automatic refrigerator as "depression proof." Hence an indicated sales total for the industry of between 800,000 and 900,000 boxes for the year 1932 is not regarded as good at all. But neither is it bad, when in times like these nearly a million homes find the inclination and the money to purchase an article that probably averages around $200 per home.

What the sales total will be for 1933, no one of course can predict accurately. But one thing is sure. Whether a big increase arrives then or not, it is on its way. For no matter if women do hold off buying for a time, their desire to own an automatic refrigerator keeps right on growing. At present this product is going through the same evolution that the automobile went through—only at a much faster rate. In the beginning an automobile was a luxury, something for the rich only. Today it is a necessity that even the day laborer's family thinks they have to have. The big question in the minds of home owners today is not: "Should I buy an automatic refrigerator?" It is fast becoming: "Which refrigerator should I buy?"

Any gas company that enjoys public confidence in its community ought to be in an extremely favorable position to swing the answer to the gas refrigerator. For the gas company's representative has an advantage that any ordinary appliance salesman would give his eye-teeth to have. The ordinary salesman is up against one big obstacle that is apt to nullify all his skill and all his arguments. That obstacle is getting inside the door and getting a chance to tell his story. The salesman who can say "gas company" at the door has an open sesame that gives him a big advantage.

Another factor that the gas company representative has in his favor today is the changing attitude toward gas refrigeration. Four years ago or less, women wanted an electric refrigerator, not a gas one, because they felt that electricity was more modern than gas. Today they are not so sure. The impression has gotten around that maybe a refrigerator run by gas is more modern than one run by electricity after all. And the feeling now is: "Perhaps I'd better go down and look at that gas refrigerator before deciding anything."

Of course, these advantages are just a start. Those companies that have made a real success of gas refrigeration, have found that in addition certain fundamentals must be observed.

First of all, the management of the utility must really get behind refrigeration and let their employees know that they want the business and are going to get it or know the reason why.

All employees of the utility must be made to understand that they are members of the sales department too, and that clerks, meter readers, service men, everybody—have a definite responsibility in furnishing leads and promoting sales.

The sales force must be provided with prices and terms that enable them to meet competition on its own ground.

The sales department must be backed up by an adequate service force, specially trained and organized along refrigeration lines.

One of the most important fundamentals has to do with selecting, training and maintaining a sales force. The utility must recognize that refrigeration selling is different from selling any other gas appliance and demands special attention. It represents the highest type of specialty selling, and no general appliance man can compete successfully with a highly specialized competitor selling electric refrigerators alone.

It is common practice for gas companies to campaign certain products at certain times of the year. But the electric refrigerator dealer plugs at his business twelve months a year. If the gas company is to compete with him, it must do likewise on gas refrigeration.

Most gas utilities close their showrooms when the general office closes around five or six o'clock. The electric refrigerator dealer knows that most retail sales are made in the evening when husband and wife are together, and so he keeps his display room open all evening. The gas company's showroom must again do likewise if it is to compete successfully.

A certain amount of money should be spent for advertising and direct mail, but unless the direct mail is personally followed up its effect will be lost.

To sum up—with the public as refrigeration minded as it is today, with the gas refrigerator increasing in favor all the time, and with the utility salesman starting with a definite advantage, there should be no question about the future of gas refrigeration if gas companies will employ the best methods and practices of their electric competitors and meet them on their own ground.

The Future of The Gas Industry

ARTHUR HEWITT

Vice-President and General Manager, The Consumers' Gas Company of Toronto

I SUPPOSE there has never been a time in the history of the gas business when so many problems, varied in their character, have presented themselves for solution as at the present time. If we were to concern ourselves with those things only which relate to the immediate present, our task would be a simple one, but we have acquired real estate, erected substantial buildings, installed costly generating plants and equipment, constructed elaborate distribution systems, and have trained and organized personnel not for immediate needs only, but in confident anticipation of future business expansion. Enormous investments have been made on the basis of a continuing demand for gas.

The wise administrator recognizes the importance of developing business along lines calculated to secure for his product the widest possible variety of uses. There is very definite and keen competition between gas and other fuels for the heating business, each competitor claiming advantage in some particular regard. Gas has certain inherent qualities which must be emphasized, and any policy of "laissez faire" on the part of the gas industry in promoting new business will result in disaster. Efficient organization of individual companies is important, but having regard to the fact that many of the problems facing the industry are common to all, how necessary it is that unstinted support be given to our American Gas Association, organized and equipped as it is to investigate problems and report to and advise member companies on any and all matters related to the industry, and whose record of accomplishment hitherto has been so gratifying. In my judgment, there is greater necessity today than at any previous period for maintaining that institution at the peak of its efficiency. As an industry, we cannot afford to economize in our financial and personal support of Association activities at a time as important as the present. Our efforts must be concentrated upon the protection of the business we already hold and in promoting the sale of gas in new fields hitherto held by competing fuels. In my judgment, there is much new and profitable business yet to be obtained, and I am firmly convinced that in combining our efforts through the channel of the American Gas Association, plans, policies and practices will be matured which will ensure the continued success and prosperity of our great industry.

Looking At The Utilization Question

FRANK H. ADAMS

General Manager, Surface Combustion Corporation

IN a period of depression when fundamentals tend to stand out in bold relief, it has been interesting to observe the extent to which quality of utilization equipment has determined the holding or loss of load against the increased price competition of other fuels. Each customer large or small is applying the acid test of requiring that every expenditure be justified by the earnings and value of the service rendered. Reduced cost of competing industrial fuels has only emphasized the problem of the gas industry of selling the higher B.t.u. cost to meet this test.

In many cases an appreciation has come too late that the justification of the higher B.t.u. price of gas must finally be made in the customer's own mind on the basis of his own experience in the use of gas. If he has not been sold the equipment which has permitted him to justify these costs, either the load is being lost or rate concessions are being forced.

The range industry is making a heroic effort to bring the nation to an appreciation that the service of a range, and of gas as a fuel, cannot be measured on a range as obsolete as a kerosene lamp. The facts revealed by the very necessity of such an effort emphasize both the need and opportunity of sound and aggressive sales planning on all uses of gas. It is particularly true of industrial uses. An installation that tends to confirm, through the customer's own experience, the claims of gas competitors that gas is a "luxury" fuel or that it cannot give the results obtainable from other fuels is not a proper part of a sound load building program.

Sales resistance and potentials should be analyzed to determine the best type of equipment to offer. This does not mean that only the last word in equipment should be sold. It does require that the customer appreciate the standard of quality of utilization he is buying and have definite knowledge of the limitations and possibilities of good equipment.

In many industrial processes such as continuous gas carburizing, bright annealing, forging, glass melting, and cement burning, marked progress has been made during the past year which opens new potentials to the gas industry and new values of gas to the consumer. Diffusion combustion, both as a firing system and as a means of conditioning the atmosphere in gas fired metallurgical furnaces, represents a marked improvement and opportunity for better utilization. These are all accomplishments of gas. They make possible an expanding gas service at a time when markets generally are contracting. They create values which are simply added reasons why gas, properly sold and properly used, is one of the most economical fuels available today in industry and in the home.

Gas and Air Conditioning

W. H. CARRIER

Chairman of the Board, Carrier Lyle Corporation

I HAVE felt for many years that gas was the logical fuel for the city home and for the small user of fuel. Its unquestionable advantages in convenience, in the saving of labor, and in cleanliness, mark it as the ultimate fuel to be desired.

The city and suburban property owner pays dearly for the privilege of polluting his atmosphere with smoke and sulphur fumes. His payments are made not only in extra costs for cleaning and renovating but in depreciation of the metal parts of his home due to corrosion. The use of a smokeless fuel practically free from sulphur fumes, such as modern manufactured gas, makes it truly economical for him to burn a somewhat more expensive fuel even were he to disregard the lower cost of servicing his heating plant.

Gas will undoubtedly play a great part in the development of the new and growing industry of air conditioning. The public is rapidly learning that it is possible to have the indoor conditions in their homes ideally comfortable in all seasons of the year—in the hot humid days of Summer as well as in the frigid days of Winter.

With gas, it is possible to offer them today a complete air conditioning system which will maintain a uniform healthful temperature and humidity as well as cleanliness in their homes in Winter and, at the same time, make them a refuge from the excessive heat and humidity of mid-summer. One of the greatest advantages, however, is in Spring and Fall when only a few degrees of heating are required morning and night. Under such conditions the use of gas in connection with air conditioning has no rival.

It may seem paradoxical to use heat for cooling, but many railroad cars are operating today using steam from the locomotive for maintaining a temperature from 10° to 20° below that of outside. As an illustration, the dining cars of the Santa Fe Railroad pass through regions which range in temperature from 105° to 120° while the temperature in the dining car never exceeds 75°. And yet this is accomplished with steam taken from the locomotive. The principle and mechanism is exceedingly simple. Steam is used in an ejector which produces a high vacuum. This causes the water used in air conditioning to boil at a low temperature, thus removing the heat absorbed for the cooling and air conditioning process. A similar principle is being applied to homes, small restaurants, and even to some of our larger buildings which are being air conditioned.

For air conditioning work, the requirements are not only very exacting but variable, requiring a rapid and almost instantaneous response to demands occasioned by changes in weather conditions, sun light, or occupancy. The production of refrigeration through the generation of steam to answer theseair conditioning demands is ideally met by the use of gas fuel.

Further than this, one of the growing draw-backs to the extensive use of gas for residential heating purposes is the present high winter load factor. In the conditioned home of the future the total demand for the summer air conditioning load will be over one-third of the winter heating load, thus spreading out the demand much more evenly throughout the year than at present. In addition, it may be estimated that the equipment for summer air conditioning will not add more than 50% to the cost of equipment for winter heating, bringing it within a practicable range for owners of the better class of homes both from the standpoint of installation and cost of operation.

I feel I am safe in predicting that the use of gas will go forward rapidly in the next decade coincident with the progress to be expected in the application of air conditioning.

Current Trends in Gas Measurement

JOHN C. DIEHL

Chief Engineer, American Meter Company, Incorporated

THE most distinctive manufacturing trend especially in meters for high pressure gas measurement has been toward the elimination of chart records as a factor in the determination of volume in standard units as measured by the meter.

All displacement meters measure the volume in cubic feet at pipe line conditions. If the pressure is greater or less than the pressure of the standard cubic foot, the multiplying factor as determined from the chart records of pressure is applied to the reading to express the quantity at standard pressure conditions. Likewise, in some cases, if the temperature is greater or less than the standard temperature, the multiplying factor as determined from chart records of temperature is applied to express the quantity at standard temperature conditions. When the pressure varies, the pressure factor is obtained from a volume, pressure, and time recording gage or a volume and pressure gage. Values by this method are determined through inspection, depending upon the personal observation of the chart reader.

Within the past few years automatic instruments have been devised in which the index reading is continuously multiplied by the pressure factor and the result in cubic feet at standard pressure conditions is indicated by a counter index. Likewise, instruments have been devised to multiply the volume passing through the meter by the pressure factor and subsequently by the temperature factor so that the volume indicated by the counter index is the volume in standard units.

There has also been a distinct trend toward the use of straight reading indexes on high and low pressure displacement meters. Such indexes have been developed so that the last digit appears and disappears upon a change amounting to a fraction of a cubic foot and the reading can be obtained by any party, even though he may not be familiar with the customary meter index.

Another distinct trend has been the development of orifice meters to express the total pressure extension on a direct reading counter. In these integrating meters, the square root of the differential, each minute, is multiplied by the relative square root of the absolute pressure and the total extension of the square root of the product is totalized on a counter. The difference between the readings at the end and beginning of a period are multiplied by the unit orifice coefficient to obtain the quantity which passed during the period. This feature has also eliminated the human factor in the deter-

mination of the values of the chart records and the subsequent laborious calculation of pressure extensions.

Further than this there is considerable fact finding effort continuously under way in promoting the most effective meter manufacturing, proving and maintenance practices.

In the field of meter maintenance particularly there is growing activity and interest on the part of gas companies in the economic advantages to be derived from a systematic policy in regard to meter records. Such records are being applied for determining the average annual cost of meters in various districts. Performance records are further being segregated according to various kinds and classifications of meters, with respect to type, make, age and repair category. In this manner, a company may readily determine, in accordance with individual conditions, at what age period or in what condition of deterioration a meter can be advantageously condemned from an economy viewpoint. Similarly, other reliable cost finding data on meter handling and maintenance is sought to be specifically obtained.

Now Is The Time To Modernize

F. W. CURFMAN

Vice-President & General Manager, Improved Equipment-Russell Engineering Corporation

THE improvement in the utility security market should result in a real upward turn of our business but the change, so far, has been in sentiment rather than in the actual signing of contracts.

The general building and construction business has been hard hit the past three years and we that serve the manufactured gas industry are no exception.

This month's "Nation's Business" printed the words of a large contractor, which is a fairly good description of the existing conduct of our business.

> "When I look at my industry, I am reminded of nothing so much as a pack of starving dogs hanging around a kitchen door. Now and then, the door opens and a small piece of meat is thrown out. It isn't enough to satisfy even one dog but they all start for it. Two or three are maimed or killed. The dog that gets it is pretty well torn up but he manages to hold on a little longer."

We have every indication that there is considerable work to be done and, at the present time, we are busy revising former quotations and pricing new work, but these apparently urgent undertakings continue to be deferred waiting a more favorable market.

The popular practice of the gas utilities has been to conserve cash, even to the extent of sacrificing normal maintenance and repairs. Gas plant apparatus has a tremendous ability to take punishment and it has had to take it the past few years.

Nothing that contributes to our business seems to have shared materially in the generally reported business improvement. However, we can reasonably expect the present buyers market to be reversed in the near future and some few will be obliged to pay heavily for their delay.

Factors of Importance to The Natural Gas Industry

A. B. MACBETH

President, Southern California Gas Company

THE factors most important to the natural gas industry of today in my opinion, are as follows:

1. More flexible regulation to enable natural gas companies to meet competition and obtain new business.
2. Increase in activities as follows:
   (a) Developing and obtaining new uses for gas as fuel.
   (b) Sale of domestic, commercial and industrial utilization appliances.
   (c) Dealer cooperation.
   (d) Effective advertising.
3. More cooperation and assistance by gas pipe line companies with oil companies in their efforts to conserve gas produced from oil wells.

By coordinating brain ability with hard work in the pursuit of the above objectives, we will be enabled to reduce the effects of competition to a minimum and, at the same time, attain new records of service to our customers.

The Future of Gas Water Heating

H. J. LONG

President, The Kompak Company

THE value of the automatic Gas Water Heater to the Gas Company as an income builder has been so continually stressed for the past few years, that reiteration becomes superfluous. Every Gas Company alive to its future is presumably making every effort to secure this load, but there is one phase frequently overlooked that is of tremendous importance, and which is rarely stressed. It is not only a question of getting this business, but more particularly, in keeping it during the years to come.

Gas is beginning to receive a competition in the domestic field, particularly in water heating, from which it has been remarkably free. The enormous number of gas tank heaters sold in years gone by testify to the widespread general use of

gas for part of the water heating in the majority of homes to day. The furnace coil or indirect heater, however, has provided the equivalent of automatic hot water in thousands of these homes during the winter months, thus giving the user a realization of what continuous hot water means to him.

The question is,—will it be with gas? Two giant competitors have entered into the field,—Oil and Electricity. I have mentioned oil first, because it is a competitor of all Gas Companies. The combination Gas & Electric Companies may not make electricity a competitor with gas for sometime, but even then, time will bring it about.

The oil man has discovered that he can do two things,—heat the home and furnish hot water, winter and summer, with the one investment and there is a national concentrated drive on that part of your business. Thousands of dealers are utilizing the hot water argument to sell burners and the system is being constantly improved. Off-peak electric water heating in certain sections of the country at 1c has made it a serious competitor with $1.00 gas. The Gas Executive who fails to recognize these two competitors and to meet them with far-sighted intelligence, will find his domestic water heater business seriously menaced in a few short years.

Every single water heater sold today should be sold with the idea of making a permanent customer, so satisfied with both the hot water service and the quality of the heater that the competitor cannot reach him. The volume sales of low price heaters may make a temporary showing, just as a meteor flashing thru the sky makes a fascinating display, but it is not lasting. Any heater that may give out within four or five years is a mighty poor investment for any Gas Company, for when it fails, the other fellow has a better chance than you. Any heater that fails to give all the hot water required, not only now, but with a margin for future growth, will ultimately be replaced by a kind of heater which will give the customer the service that he desires. Only a heater with capacity for all hot water needs, and constructed of a metal with a long life, will give permanent satisfaction. The extra effort now to sell quality properly, will save thousands of dollars ater on to try and resell a customer when the competition is knocking at his door. Sales Managers should be given credit not for the number of heaters sold, regardless of how cheap they are, but rather what he can accomplish in each year adding as many permanent users to his lines with high grade systems of long life which will insure the future of the gas business.

The way to meet competition is to so sell your customers at the start, that the competitor will not get a foothold. His first customers will in every case be your dissatisfied ones. In one city, the first 100 electric heaters sold, in every case replaced cheap, unsatisfactory gas water heaters. Not one single high grade system constructed of the proper metal has been replaced and there are hundreds of them in service in the type of home which the Electric Company would be first to reach.

The American Public are not looking for cheap heaters,—an automatic water heater is as necessary and worth as much to the owner as a mechanical refrigerator. Why figure that they will gladly pay $200.00 or $300.00 for a refrigerator, and yet not be willing to pay more than $50.00 or $75.00 for a water heater? Good quality and good service are worth the price.

First,—Have a gas rate that will meet competition.

Second.—Continually drive twelve months a year on high grade, automatic gas water heaters, with full hot water service. By so doing, the future of gas water heating is assured; without such a policy, the competition will most certainly enormously curtail the income of this most necessary gas load in the years that are close upon us.

Anticipated Building Program Promises Opportunities

H. LEIGH WHITELAW

Vice-President, American Gas Products Corporation

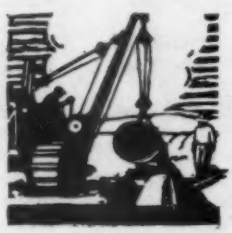
DURING the reconstruction period now close at hand, lies one of the biggest opportunities the gas industry has ever had to develop the sale of gas for all purposes, with the exception of lighting.

As employment increases, decentralization of families will take place, augmented by the million marriages annually.

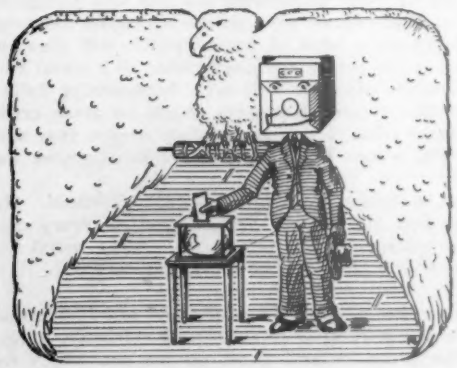
New housing is being developed for those in the lower income class group. These new projects will be so engineered that it will be possible for the gas industry to supply all services, with the exception of lighting, for this new construction, especially where natural gas is available, or promotional gas rates are in effect.

The cost of operating a completely gas equipped home of this type would come within the means of the lower-income class group never before in a position to purchase the Ideal in service and comfort that can only be obtained through gas as a fuel.

I believe it is safe to say that this new building program will be so extensive within the next few years that it will represent the largest new market for intensive development during the next decade, providing competitively, we are ready for it.



AMERICAN GAS MERCHANDISING ALMANACK



November

1932

NOVEMBER brings a thought of pumpkin pies and turkey cooked deliciously in the oven of an automatic gas range, with proper trimmings cooked over those wonderful new hi-speed burners.

A president will be elected and there will be new governors in many states, to say not a word of the new tax-making bodies. November should find every gas man exercising the right of his franchise.

November brings two national holidays: Armistice Day and Thanksgiving Day.

November no doubt will find the advantages of gas for cooking—efficiency, economy and speed of gas for cooking—talked of in the nation's greatest newspapers and magazines. Thanks to the efforts of the gas range manufacturers and the A. G. A., the gas industry to a man should support this movement. Tie into it locally.

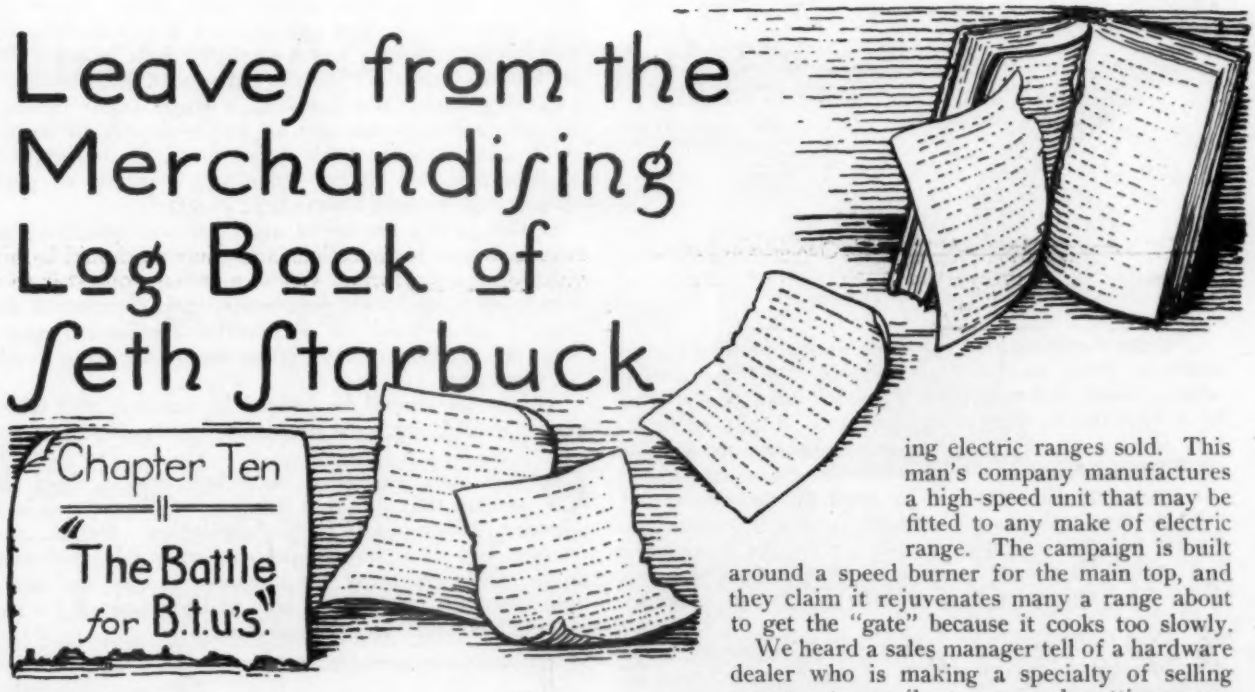
We would be mighty happy to hear of a practical co-operate localized drive being launched to sell automatic hot water service. It will come.

November offers the display advertising man a world of opportunity. Rich autumn colors, Thanksgiving season, football, Armistice Day, and all local celebrations may be used to catch the eye in connection with the window displays he may desire to install to advertise special ranges, incinerators, house-heating or dryers. Gas heater manufacturers are offering some worthwhile sales-promotion helps. If you have not already received them write for them today.

Plan now to start your sales curve on an upward swing.

1—Tues.	**Advertise Home-Service Forum in Newspapers.**
	All Saints' Day. Stamp act becomes a law—1775.
	The United Gas Improvement Company moved to new quarters in the Drexel Building, Philadelphia, 1888.
2—Wed.	**a.m. check over materials, stage, etc., p.m. demonstrate.**
	Kansas adopted Prohibition, 1880.
	J. A. Mayers was named to represent The Gas Machinery Company, of Cleveland, Ohio, in the east, 1903.
3—Thurs.	**Demonstration 2 p.m. to 4 p.m.**
	Continental Army disbanded, 1783.
4—Fri.	Franklin D. Roosevelt elected Governor of New York, 1930.
5—Sat.	Will Hays, movie Czar, born, 1879.
6—Sun.	**Advertise menus for Tuesday and Wednesday.**
	John Phillip Sousa, March King, born, 1854.
7—Mon.	Americans enter Sedan area, 1918.
8—Tues.	**Demonstrate 2 p.m. to 4 p.m.**
	Election Day.
	Jamaica (L.I.) Gas Light Company presented to each minister of the town a bronze stand and argand burner to adorn the clerical library desk, 1893.
9—Wed.	**Demonstrate 2 p.m. to 4 p.m.**
10—Thurs.	Martin Luther, reformer, born, 1483.
11—Fri.	Armistice Day.
12—Sat.	Joseph G. (Uncle Joe) Cannon died, 1926.
13—Sun.	**Advertise Tuesday's and Wednesday's menus.**
14—Mon.	**Check up materials.**
	First telephone in Pennsylvania opened at Philadelphia, 1878.
15—Tues.	**Demonstrate 2 p.m. to 4 p.m.**
	Revolution in Brazil, 1880.
16—Wed.	**Demonstrate 2 p.m. to 4 p.m.**
	Sherman began his march to the sea, 1864.
17—Thurs.	General strike in Spain, 1930.
18—Fri.	Galli Curci, singer, born, 1889.
19—Sat.	Tornado hit Oklahoma, one of the large natural gas-producing states, 1930.
20—Sun.	**Advertise special Thanksgiving Day menu.**
	Queen Alexandra of England died, 1925.
21—Mon.	Hetty Green, capitalist, born, 1835.
	Demonstrate 2 p.m. to 4 p.m.
	Cruse-Kemper Company started shipping steel for the new three million cubic foot holder being erected for the New Haven (Conn.) Gas Light Company, 1910.
22—Tues.	**Demonstrate 2 p.m. to 4 p.m.—pumpkin pie.**
	George Eliot, author, born, 1819.
23—Wed.	**Demonstrate 2 p.m. to 4 p.m.—turkey dinner.**
	Franklin Pierce, President, born, 1804.
24—Thurs.	Thanksgiving Day. Gas, the care-free fuel will cook dinner for millions.
25—Fri.	Battle of Missionary Ridge, Tennessee, 1863.
26—Sat.	First street railway in the United States, 1832.
27—Sun.	**Advertise menus for Tuesday and Wednesday.**
	First Sunday in Advent.
28—Mon.	Washington Irving died, 1839.
29—Tues.	**Demonstrate 2 p.m. to 4 p.m.**
	Wendell Phillips, reformer, born, 1811.
30—Wed.	**Demonstrate 2 p.m. to 4 p.m.**
	Samuel Clemens (Mark Twain) born, 1835.
	Clarence M. Kemp, Baltimore, designed gas burner of which he said: "The harder you blow at this burner the more stubbornly does the light refuse to go out, and if by chance it is puffed out by very strong lungs, the gas is immediately relighted automatically. It is designed particularly for use in hotels where gentlemen of rural training retire for one night's rest and arise in eternity while the coroner holds an inquest on the remains," 1893.

Leaves from the Merchandising Log Book of Seth Starbuck



WITH a great deal of pleasure and satisfaction we jot down in our log book: "Well at last it appears that gas ranges are to be nationally advertised." That is surely heartening. We hope every gas man in the United States will get squarely back of this movement to keep the B.t.u.'s we now have working in American kitchens. We also hope that they will go out and aggressively merchandise gas ranges and give the advertisers who are supporting this advertising a break.

We hope that the gas man will understand that advertising on a national scale will not keep the B.t.u.'s in the 15,000,000 American kitchens and install them in additional kitchens unless he supports it fully and aggressively. We hope that he will not only use newspapers, window display and direct advertising in telling the story of care-free gas cookery, but that he will come to the realization RIGHT NOW that "He that has goes after it."

On all sides we hear talk of the inroads certain fuels are making, or are planning to make on the cooking load. We hear dyed-in-the-wool gas men say "there's nothing to it; gas is the cooking fuel of the future." We are not so sure of that *unless* a lot of *static* is overcome in the minds of a number of managers and sales managers scattered hither and yon.

If you have any doubt in your mind that the home manager is not being told of the so-called advantages of other fuels read the women's magazines. What a wonderful publicity organization some folks have. Take a look about you in your two-car neighborhoods; talk to women and talk to the manufacturers of cooking appliances which consume other than gas. Visit the smaller communities not now served by gas and whose populations eventually move to the larger gas supplied towns. Here you will find vast numbers of people who have been pretty well sold on the "flameless fuel" as one range manufacturer has termed electricity. You will find them using oil.

A FRIEND in Pittsburgh has shown us campaign after campaign that have been successful in keeping electric ranges sold. This man's company manufactures a high-speed unit that may be fitted to any make of electric range. The campaign is built around a speed burner for the main top, and they claim it rejuvenates many a range about to get the "gate" because it cooks too slowly.

We heard a sales manager tell of a hardware dealer who is making a specialty of selling pressure-type oil stoves—and getting away with it in good style in a city approaching the million mark. We heard a woman discussing the advantages of electric cookery in the language of the Joneses—"Why all the people in Upton Manor are getting those new electric ranges." This would not cause us a moment's concern if we did not get another side of the picture. "The —— Gas Company is not going to have outside salesmen after the first of the month. They will sell from the floor only." And from a sales manager: "There is no use trying to sell ranges in a big way any more. Everybody's got a range." But why go on? Let's get out after those B.t.u.'s.

November is an ideal month in which to stage a series of cooking schools. Let's give it a whirl. Here are a few suggestions:

GO to the advertising manager of your local newspaper and offer to co-operate with him in staging a co-operative cooking school two days each week during the month of November. This school, cooking demonstration, or Home Service Forum, as you choose to call it, is to be advertised by sizeable space in the newspaper, and, along with your advertisements, other local merchants co-operating in the project would advertise also.

The newspaper, without cost, would he required to solicit all advertising and supply a daily story featuring the school. The merchants co-operating would supply food-stuffs and attendance prizes without cost. Everyone participating would be privileged to display merchandise and give away samples, recipes, etc.

In conducting schools of this kind, an outside demonstrator is frequently employed. Where the gas company has a Home Service department it is more satisfactory to have a member or members of that department to conduct the demonstration. This not only insures an unbiased demonstration of all appliances and food-stuffs, but arouses more interest because of the fact that the demonstrator is acquainted with many of the women in attendance. "Experts," said one man who has had a great deal of experience in conducting cooking schools, "do not get the questions from the

audience. Folks do not like to appear 'green' before total strangers."

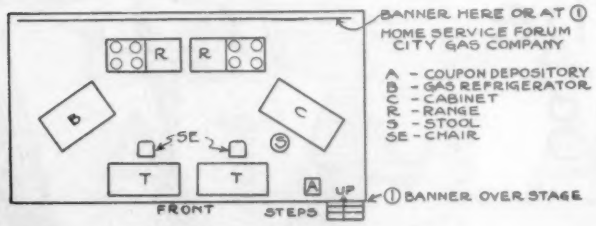


Fig. 1—Plan for Stage

The gas company also furnishes all the cooking equipment in these co-operative schools; kitchen cabinet, tables, chairs and any other furniture may be supplied by a local house-furnishing concern. A gas refrigerator is also supplied by the gas company, as well as attendance tickets and two banners—one to use above the stage and the other to be used on the outside of the building where the school is being conducted. Rental for the building is paid for by the newspaper and an exhibit charge is made to all co-operative agencies. This money is used to help defray the expense.

ANOTHER type of cooking school is one in which the gas company stands all the expense, does all the advertising, uses its own demonstrator, purchases all the food-stuffs, awards all the prizes and furnishes all the appliances. These demonstrations are usually conducted in the company's store or in a rented store room in the down-town district. Where demonstrations of this kind are conducted, the newspaper, in return for the advertising and because of the local news value, is usually glad to run daily news stories about the demonstration—if the material is properly prepared for them by the demonstrator.

In planning your newspaper advertising, plan to use a photograph of the demonstrator in your advertising, and news stories. We are all interested in people. Investigators have found the best days to conduct a cooking school demonstration to be Tuesdays and Wednesdays. The best days to advertise such schools are Fridays in the Foods section of the newspapers and Sundays in the Women's section.

Many cooking schools give the entire final week to a baking contest and where major awards are made, they are always given out on the last day of the session. Some schools require that the contestants in order to receive the award, must be present in the school when prizes are awarded.

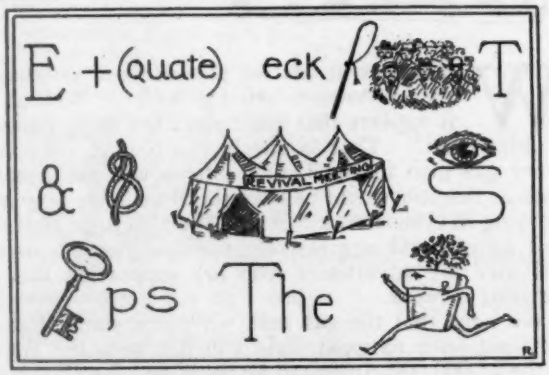
Where grocery concerns and food-product manufacturers are co-operating, many samples are distributed and there is usually daily awards of baskets of groceries or quantities of food. Where the gas company conducts the demonstrations, coffee and cake are usually served at the close of each daily demonstration. At each demonstration the audience is made to feel as much at home as possible from the very first, in order to provoke questions which the demonstrator may answer from the platform. Interest of this kind is most desirable.

NOW we come to the general lay-out of this stage which is shown in Figure 1. This illustration should be self explanatory. Aside from a gas range, kitchen cabinet, two tables and a refrigerator, some of the other appliances used are mixers, patent can-openers, a dishwasher, etc. The utensils should be of the demonstrator's own choosing. There should also be provided large dinner plates, salad plates, large and small platters, tea-cups and saucers, a half-dozen sauce dishes, two porcelain water pitchers, three or four mixing bowls of assorted sizes, a half-dozen glass tumblers, a carving knife, two dishpans, a waste paper basket a sanitary garbage can and an ample supply of knives, forks and spoons. Aside from these, there should be an abundance of kitchen linen and a supply of paper plates, napkins and spoons.

Where prizes are to be awarded and questions answered, boxes for questions and coupons should be provided on the platform. Where a baking contest is to be held, two or three local people should be selected; a chef from a local hotel, or a favorite restaurant, and a Domestic Science teacher from the public school make excellent ones.

All entries should be judged by number and where several awards are to be made, entries classified.

OPEN each session of the school with a short talk stating that the sole purpose of the school is to acquaint people with new appliances, menus, and recipes, as well as how to prepare and cook wholesome meals. By promoting the new gas ranges and better home cooking you will be able to keep your B.t.u.'s in the kitchen and capture many more.



Starbuck's Rebus—Answer on page 124

A Heavy Tax Bill

PUBLIC Service Corporation of New Jersey and its subsidiary operating companies during 1931 paid in local, state and federal taxes nearly seventeen million dollars. This sum, which exceeds by more than $1,500,000 the amount paid in 1930, is by a considerable margin the largest tax bill paid by any single organization in this state.

Year by year taxes have been taking a larger and larger share of Public Service's earnings. During 1904, the first full year of the Company's operation's, taxes claimed but 4.8% of operating revenues. By the year 1921, the percentage had increased 9.8%, or more than double. In 1931, more than twelve cents out of every dollar of the entire Public Service operating revenue went to pay taxes.

Perhaps an even more impressive idea of Public Service's role as a taxpayer may be had from the fact that during the period of 1903 to 1931 inclusive, the organization has paid in local, state and Federal taxes $167,220,877.44.

Indications are that in 1932 Public Service's taxes will be heavier than ever, for the recently passed Federal budget balancing bill will add approximately $1,400,000 to the tax burden.—*Public Service News.*

Effective Advertising Appeals

Analyzed by The Copy Writer

No. 5—The All-Gas Home

IT has a fine, hearty ring, this expression—the "All-Gas Home". It certainly expresses the objective and ambition of every gas company executive. Naturally, we want to sell an all-gas home for every gas meter on our lines; this, undoubtedly, is one of the chief reasons why that description has become so popular as an advertising slogan for innumerable gas utilities. Like many other themes that have achieved general circulation, it has its uses as well as its abuses, and therefore deserves close and impartial analysis by the advertising gas man.

Taking its possible objections first, we hear it said that the all-gas home is too much of a parcel for the average purchaser to swallow; that, in any case, he or she is not interested in an "all-anything", but buys each appliance for what it can do, regardless of its source of energy or particular method of operation. It is also said that the average all-gas campaign confuses the hopes of the gas company with the desires of the public; that it is the longest way 'round to selling a gas range or a gas furnace, each of which, after all, performs an entirely distinct and separate function in the home.

GAS stands ready to serve every member of the household. Modern Gas Range Cooking, Gas Refrigeration and Automatic Gas Water Heating lighten mother's household cares and make the children healthier and happier.
Father comes in for his share of comfortable living with an Automatic Gas Heating Plant in the basement. No more worry about fuel or ashes and no more furnace tending.
GAS—the comfort fuel
Visit the Record Model Home
326 E. Allen Lane
(Open Daily and Sunday from 2 P. M. to 10 P. M.)
Those who visit this attractive home will spend a most interesting time inspecting these modern GAS devices that tend to make life more comfortable for the entire family.
It's an ALL-GAS Home
What ANY fuel will do, GAS will do BETTER
THE PHILADELPHIA GAS WORKS CO.

It is true, of course, that it is harder to sell a group or ensemble idea than a single product. It is even possible that the sale of the latter may be sacrificed in some cases for the sake of general effect which looks to the future. However, the fact that the all-gas theme has been used successfully by numerous companies throughout the country for a number of years proves that, when properly applied and its limitations thoroughly understood, it can be made to give service as an effective advertising appeal. There is probably no better way to make the public "gas conscious", as the advertising experts put it—if that happens to be the objective of your campaign.

Whatever its merits as a straight gas company proposition, this method of advertising is peculiarly suited to the requirements of a "combination" utility. One such company defines it as follows:

"The 'All-Gas-and-Electric Home' is a household in which is found every important modern device offered by gas and electricity for comfort, convenience, cleanliness and lightening the burdens of home-making."

This definition is then followed with the message—"It Is Actually Cheaper To Be Modern with Gas and Electricity."

Granting that this sounds more sincere and plausible than the strictly "All-Gas House"—so-called because it has at most five or six gas appliances confined to the basement and kitchen,—we find the gas idea stressed to good advantage under such headlines as "GAS Wherever Heat Is Used in the Home"; "Do You Know How Many Things Your Gas Company Can Do for You"; "In the Background Stands Gas Service"; "The Gas Company Pitches In"; "Get All That Gas Service Can Give"; "Gas, the Comfort Fuel," and "Introducing the ALL - SERVICE, ALL - COMFORT, ALL - GAS EQUIPPED HOME."

The fact that advertising becomes more effective as we particularize, however, is shown as one finds the basement and kitchen treated separately. An excellent basement theme has been developed out of the caption,

"For Comfort—A Warm House Comes First, Hot Water Next!" The kitchen is more generally favored, however, as we see by the following: "Fit a New Kitchen Into Your Present Home"; "The Teamwork Kitchen"; "Let Gas Service Help You Shorten Kitchen Hours"; and, from the A. G. A. Advertising Copy Service, ". . . So Easy To Entertain When Gas Cooks and Cools the Refreshments Automatically."

In looking over the headlines quoted above, one quality seems to be reflected in most of them—a common denominator that does not appear to be entirely the result of a coincidence. They are nearly all expressed from the standpoint of the selling organization instead of that of the buyer. We are not prepared to say that this quality is inevitable in the All-Gas idea. Observation merely indicates that it has been so interpreted in a majority of instances where the theme was employed in advertising copy.

A glance at the headlines in one of our national magazines will illustrate the converse of this proposition. Here are just a few, picked at random but keeping in mind their applicability to the promotion of domestic gas service in a general way:—"Surround Yourself with Comfort"; "For the Whole-Family House"; "Now We Have a Home"; "Have You a Restful Home?"; "Homes of Which Much is Expected"; "That Home of Your Dreams . . . Make It Come True"; "Making the Homes of Tomorrow", and literally dozens of others that attempt, with varying success, to interpret the thoughts and hopes of the reader.

We are reminded from this that the All-Gas theme has often been suggested for national or regional advertising of the gas industry. It would be interesting to see how such a campaign would work—interesting, that is, from the standpoint of practical results. Proponents of such a plan say that it will help to make the public interested in gas. One may fairly ask if this is really to be desired, at least to the extent of spending the large sums that would be required in attaining that object. Does mere public interest in a product guarantee its acceptance? Obviously not, unless other conditions are right. The public is really interested in a product, apart from its possible entertainment, or curiosity appeal, simply for what it can do for them. Even the most incurable optimist can hardly expect that large numbers of people will describe their homes proudly as an "all-gas house" any more than as an "all-window", "all-chimney", or "all-Japanese-wall-paper" house. On the other hand, they will—they already do in thousands of cases—speak of a Gas-Heated House. They will go out of their way to tell about their Gas Refrigerator, if they own one. "Gas-heated water", however, is virtually never referred to in this way. The gas range is taken for granted.

Isn't there some kind of a moral or lesson here for the gas company advertising man? After all, there is no more gasoline sold because people are "gasoline-minded." Gasoline is bought for use in automobiles, because somebody wants to go somewhere. A particular brand of gasoline is selected because the purchaser has been "sold" on its anti-knock quality, more-miles-to-the-gallon, or possibly just a feeling of confidence in the company or dealer. Admittedly, the problem here is not to encourage additional uses for the product, but more frequent repetitions of a single use. Nevertheless, the principle is the same. The function is what counts, not the medium or agent except as the latter is peculiarly adapted to that function.

We believe that gas is the ideal fuel for heating a house, maintaining a hot water supply, preserving food, and cooking it. We can demonstrate that contention in a dozen different ways. But each such application of gas service must be demonstrated separately. Each appliance, for each purpose, has advantages peculiar to its function in the home. When we lump them together under an "All-Gas" classification we must be careful to see that our story is logical, and that it bears some relation to the customer's needs.

Where, in our opinion, the All-Gas idea can render efficient service is in situations that require a demonstration of the versatility of gas. Many persons think that gas is nothing more than a cooking fuel, and that on a declining scale. We know some otherwise intelligent and well-informed persons who honestly wonder how the gas industry can keep going now that it has lost the lighting load. Very few people have any idea of the extent to which gas is not only usable, but preferred, in a variety of ways.

A campaign to educate the public along this line should of course, include the industrial field. Perhaps a different application of our theme is in order. Why not the ALL-PURPOSE FUEL?

It Pays to Harness All Available Resources in Building Domestic Revenue

(Continued from page 33)

Every employee of the Company was urged to turn in prospects for which they were to receive $3.00 when a sale was consummated. Other features of the campaign, included special prizes to salesmen making their quota; also recognition to the high salesmen for the campaign period.

Immediately on the close of the Automatic Water Heater Campaign, due to its successful results during a so-called depression period, a Summer Gas Heating Campaign was started.

Plans for this campaign were made along very similar lines to those which had proven so successful during the Automatic Water Heater Campaign.

After holding meetings with the leading manufacturers and dealers, it was decided that a special buying offer would be necessary to induce consumers to purchase during the Summer months. In addition to the special selling offer an extensive advertising program was laid out using practically the same mediums as were used during the preceding campaign, the utility publicity always carrying the invitation to the public to "See your local dealer or the P. G. and E."

The special buying offer consisted of a liberal summer discount which was allowed on all gas heating equipment purchased during the months of July and August. Down payments as low as 10% were offered with monthly payments which were to begin on October 1st extending as long as 18 months, depending on the cost of the installation.

Although a high quota was set for this campaign an accomplishment of 130% was attained. Dealers throughout the territory contributed materially to the accomplishment of this quota and are enthusiastic about the benefits which they derived.

Load-Building German Poster Displays

STUART BRATESMAN

Manager, Display Department,
Boston Consolidated Gas Company

IF YOU are interested in increasing the load of your company,—and who isn't these days—might we offer this suggestion: give a serious thought to your windows. Do you realize that right in your own building lies an important and powerful advertising medium? Thousands of people pass daily; what are their reactions? Do they hurry by because there is nothing of interest to stop them? Don't overlook this golden opportunity of securing potential customers for your lines through sales messages in displays that are calculated to arouse and sustain interest.

By far the most effective medium for introducing window display ideas is the poster. We naturally turn to the Germans, originators of the poster, for examples of the best in this fascinating art. Ponderous gas appliances require smashing areas and designs for effective results. The poster background has unlimited possibilities for development in gas displays.

On these pages are reproduced examples of German poster displays in gas appliance window displays. Let's look them over. There is much more to each one than appears on the surface.

The display advertisement headlined "In City Apartments" . . . was designed for exclusive use in the apartment sections of a city. If you have ever lived in the average two-by-four modern apartment you can readily appreciate the necessity of a compact

range. This display was typically German throughout. Design, art work, type of lettering selected and colors all lend themselves to the basic design that will tell the story quickly and effectively. The colors are worth mentioning; the figure was painted in three shades of blue, plus black and white, which contrasted strongly with the orange gradations in the stepped background areas.

The befuddled housewife in the Home Service set shows another method of using the poster in gas company window displays. The huge orange question-mark has an important place in this design, as has the odd type of German lettering selected for the copy. Notice that there are no capital letters in this copy. This is a departure from the prosaic form of lettering in displays and differs greatly from the accepted standard of American lettering.

"Healthy, and he looks it!" . . . and what better way is there to illustrate this thought than the giant head of the laughing man? This is the poster in its strongest

form. The brilliant shades of orange used to paint the areas of this head fairly shout at the reader. The black background and the cool colors in the foreground gave strong contrast to the head. Imagine this advertisement in *your* windows! Don't you think it would stop people and arouse interest in what you have to offer?

Again, in the treatment of the man looking down on the gas range, the poster has been effectively used. Art work of this type is very difficult because of the fact that the figure must be perfectly drawn underneath. All details have been eliminated from the finished areas but they existed at one time during the procedure. Form is finally represented in this technique by areas of color alone. This particular figure was painted in two shades of magenta (cerise) on a lighter circle of the same color. First person copy was used for reader-interest.

Window displays based on the German poster should form a strong link in the load-building activities of the modern gas company. Try them in your windows and give your "sidewalk audience" something to look at and to remember. Window displays cost less to prepare than most forms of advertising and they do their job twenty-four hours every day in all kinds of weather, influencing all kinds of pepole.

Putting Gas House Heating Over the Top

Fuel cost to homeowners not found important obstacle in making heating and appliance sales

CROSBY BREZEE

Manager, House Heating Dept.,
Long Island Lighting Co.

As told to Robert C. Nason

OUR policy of laying the cards upon the table in discussing fuel costs in connection with heating homes by gas usually result in orders. Although the greater number of our sales are for equipping new buildings with gas-fired boilers, our conversion burner business has exhibited growth of late and is expected to increase more rapidly in the immediate future.

The only buildings we canvass are new ones. Through construction reports and personal observation, usually information on new building reaches us as soon as plans are prepared. Whether this is a residence, a store, church or what, one of our three house heating specialists contacts the owner as early as possible.

First Aspects of Sales Talk

Naturally, the start of the sales presentation discusses the automatic and cleanliness features of gas heating. This must, under all circumstances, be the ground work for any genuine, successful merchandising program. Having carried the conversation this far, invariably the prospect asks about costs.

To meet the situation, figures on known fuel costs per season in other structures already gas-equipped are shown and photographs and all details of such buildings offered. One of the most valuable aids in this part of making sales is our handsome 24-page catalog called "Heating Your Home," sponsored jointly by the Long Island Lighting, Queens Borough Gas & Electric, Long Beach Gas, Kings County Lighting and Nassau & Suffolk Lighting companies.

This contains half-tone views of 40 different buildings and homes, that are gas-equipped, 18 testimonial letters and several pages of practical data on heating costs. When prospects have examined this publication our case is practically closed if readers analyse the matter from the ground up.

The majority of our leads for new business reach us via the return card and mailing folder, of which a complete series is sent out monthly. In July our regular newspaper half-page advertisements in local papers reached some 800,000 readers daily.

(Continued on page 48)

Economical pipe for Gas service

MINIMIZED CORROSION

Mill-scale is one of the principal causes of pitting; it is electronegative to the pipe metal and sets up galvanic action causing pitting around the scale areas; therefore, when the mill-scale is removed, longer life is obtained from the pipe.

CLEAN, SMOOTH SURFACES INSIDE AND OUTSIDE

—forming a better base for galvanizing or other protective coatings and finishes.

The Scale Free Process is a patented feature applied only to National Pipe (butt-weld sizes ½ to 3-inch). Therefore, National Scale Free Pipe is different from any other pipe and the outstanding value in pipe for gas service.

NATIONAL TUBE COMPANY, Pittsburgh, Pa.
Subsidiary of United States Steel Corporation

FULL DELIVERY CAPACITY

—less friction loss, because there are no obstructions to the flow.

NO DAMAGE TO VALVE SEATS

—no clogging of small orifices, because there is no mill-scale left in the pipe to break off.

GREATER STRENGTH AT THE WELD

The additional rolling which scale free pipe receives, increases the strength at the weld approximately 20 per cent, making the pipe especially desirable for bending, coiling and special uses.

NATIONAL SCALE FREE PIPE
SPELLERIZED

(All National Galvanized Pipe is given a special chromate treatment to resist discoloration and the formation of white rust. This patented process preserves that smooth, glistening surface or metallic luster characteristic of good galvanizing practice.)

Putting House Heating Over Top

(Continued from page 46)

In making calls on prospects our men have to do some little evening work to reach the man of the house, for, strange as it may appear, it is the man of the house who understands gas heating more than his wife. Although housewives appreciate the virtues of gas, quite often they cannot grasp the reasons for the relatively higher cost. We find that it is the more practical member of the family who grasps the automatic and safety features first and is perfectly willing to pay for his fuel monthly instead of in large bills periodically or seasonally. Any student of psychology will agree that one would rather pay $12 monthly than $144 yearly in bulk. And we find this to be true in selling house heating.

A great many of our installations are of a commercial nature, one of our latest jobs being the heating of bath house locker rooms, restaurant and other sections of a large New York State-owned building and swimming pool at Jones Beach, probably the finest in the world. Gas here replaced oil burners and serves 2,400 square feet of radiation. We also have equipped several commercial greenhouses, stores and like places.

Despite the fact that 87 gas boilers were sold by us last year, much of the fuel load occurs in some half-dozen extra large residences on wealthy estates. For example, that installed in the W. W. Willock dwelling at Syosset handles 5,600 square feet of vapor radiation, that of F. W. Allen, North Hills, has an equal amount and we have several others of about the same size. One gathers an idea of the enormous cubic contents of these homes when it is known that the Willock residence has 28 bath rooms and is 200 feet long, rivaling in appearance the manor houses of European royalty. But, needless to say, our gas-fuelled homes of America are vastly better warmed.

Every Job Studied Individually

Every heating job is analysed individually and when there is evidence that there is something wrong with the existing heating plant, in conversion burner work, a leading plumbing and heating contractor is called in at once and asked to give to the owner an estimate on making the system right before we will install a gas burner. Our relations with contractors always have been friendly. This is due in part to our unwillingness to show partiality towards any contractors in particular.

When we sell a water heater, radiant heater, gas burner or boiler we never attempt to put in the piping nor install radiation. We call the heating contractor.

Smith may be called once, then the next call goes to Jones and the next call to Brown; the same contractor rarely is called until his fellow contractors have had their order. By thus showing fairness to all and distributing the work as widely as possible we keep them all friendly and anxious to be the next one called. We find the contractors willing to cooperate and they come to us for gas-boilers and burners when they get a chance to make sales.

Our service department is something of which we are proud. The three men on our staff make periodical examinations of all installations, adjust for correct CO_2 flue gas content and like duties.

Although to date not much has been done by the Long Island Lighting Co. by way of analysing flue gases with Orsat or other gas testers, this will be done more in the future, particularly on large buildings like that at Jones Beach, where fuel and airports were set by gas test as well as from visual flame observation.

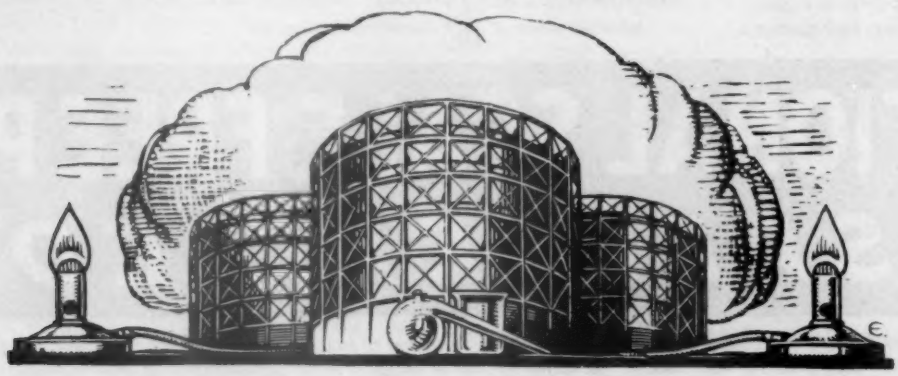
Conversion Burner Status

One reason why we have not sold a larger number of conversion burners in the past is because by the time that low water cut offs, relief valves, thermostats and controls of various sorts have been included in the price the difference between the conversion and the new gas-fired boiler is so slight that we feel our customers may be better served by purchasing a special boiler.

But we realize the advantages in being able to offer burners at comparatively low retail costs when some of the accessories are omitted. The present business situation tends to encourage more frequent offering of conversion burners. Further declines in retail fuel rates also will make conversion burners and, in fact, general gas appliance selling easier. Our present rate runs about 90 cents per thousand cubic feet for over 5,000 per month loads.

Little trouble has been experienced with existing heating plants although the greatest part of what we have had has been on steam systems. Common ailments are sagging of piping due to loose hangers, absence of relief valves, water hammer, pipes too small—this is frequently observed—poor radiator air valves, dirty and rusty boilers and like ills. Minor remedies that can be attended to in a few minutes, as, for instance, loose pipe hangers, our service department patches up, but, as already said, the major jobs go to regular heating contractors.

Air conditioning is something that we have not done much with as yet, but the minute it becomes apparent that the "bugs" have been ironed out of the equipment offered we will handle one or more reliable makes. Several gas-fired conditioners of the warm air type already have made their appearance in our territory and the future for such equipment seems to us bright, particularly for systems that employ ducts and basement heaters. "Tailored air" is something that is bound to make itself felt soon. Just now it appears to be in a formative stage.



"The SUCCESS of ELECTROLUX in popularizing the use of gas as a modern fuel is second only to the veteran achievement of the gas range"

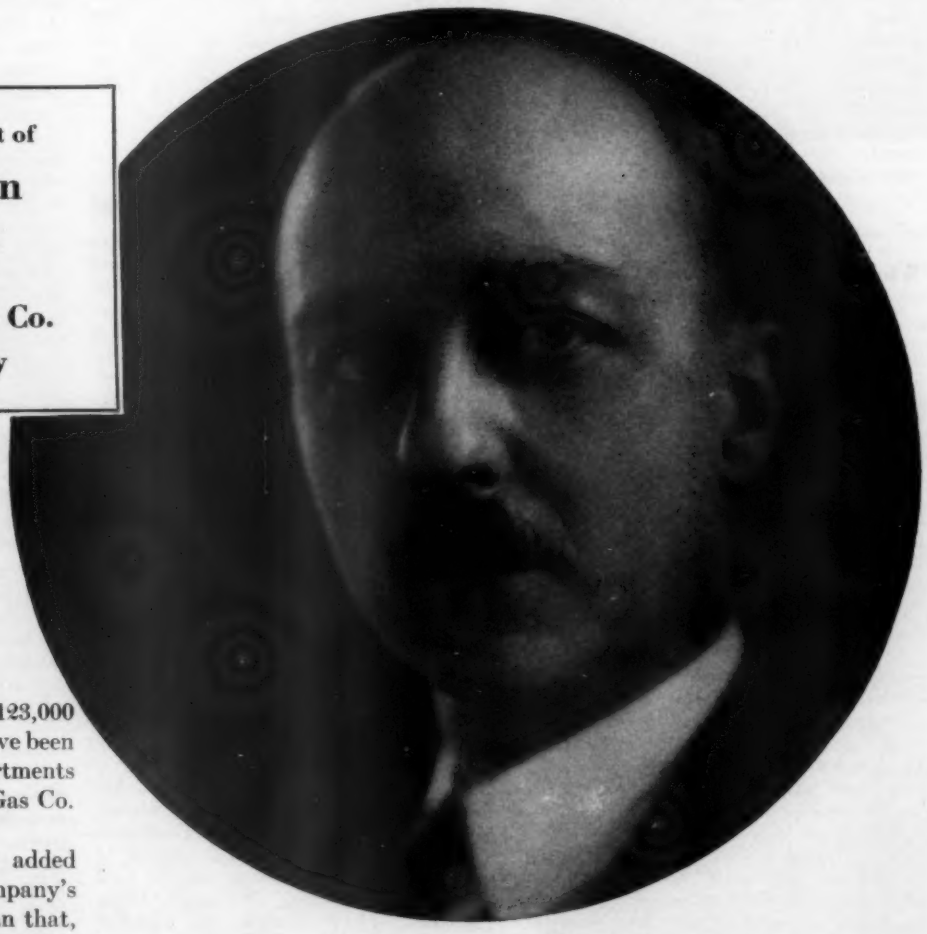
This is the statement of

N. T. Sellman

Director of Sales and Utilization

Consolidated Gas Co.

New York City



A tiny gas flame makes constant and steady cold

IN FIVE short years, over 123,000 Electrolux refrigerators have been installed in homes and apartments served by the Consolidated Gas Co. of New York!

Not only has Electrolux added over 184,000 MCF to this company's monthly load. But more than that, because Electrolux is so outstandingly modern, it has popularized the up-to-dateness of gas as fuel in this community. Has given a big impetus to the sale of all gas-using appliances.

The success of Electrolux in New York City is not a local phenomenon. It is *a national trend*, for which there are two vital reasons:

First, Electrolux offers home-owners and building operators the very last word in carefree, dependable, money-saving refrigeration.

Second, astute gas executives everywhere have been quick to grasp the significance of Electrolux as a keystone in the appeal of the All-Gas Kitchen. They have appreciated the strong desirability of merchandising and selling Electrolux with the whole strength of their organization behind it.

To assist gas companies in closing profitable Electrolux sales in their territories, we have prepared a series of valuable sales booklets. Write us for details. Electrolux Refrigerator Sales, Inc., Evansville, Indiana.

ELECTROLUX

THE *Gas* REFRIGERATOR

NEWS of the GAS INDUSTRY

Grant Natural Gas Line Franchise

No opposition being filed, the board of county commissioners at Terre Haute, Ind., has granted the petition of Frank Pierson for a natural gas line franchise from the Sullivan, Ind., field to connect with Terre Haute industries and with the Universal Gas Company lines. As the franchise was granted, the point was raised that the supply of natural gas sometimes failed and assurance was sought that a continuous supply would be given. Pierson replied that such an arrangement has been made to connect with the gas line running into the county from Texas and other points and connecting with the Universal Gas.

Wichita Company Signs Contract To Supply New Hospital

Improvement in business conditions in the territory served by the Gas Service Company is evidenced by a number of contracts for industrial gas signed in the past thirty days. A number of new contracts have been signed, other industrial plants that have been closed down are reopening and have signed contracts to use gas again and still other contracts have been made for industrial gas with firms that have been using other fuels.

The Wichita, Kansas, Gas Company was awarded a contract to supply the gas requirements for the new Veterans' Hospital at Wichita which is now under construction. The hospital is expected to use approximately 40 million cubic feet a year. The company has already started work on the construction of a new main line to the hospital, located in the southeast part of Wichita. Construction work on the gas line is being rushed so that it will be ready in plenty of time for gas to be used when it is needed during the building construction. Gas will be used in the new hospital for heating and general fuel purposes.

Proposes Regulation of Gas Rates

A bill is being prepared by Senator J. J. Loy of Sherman, for presentation before the special session of the Texas Legislature, now in session, which would broaden the power of the Texas Railroad Commission in controlling rates to be charged for the consumption of gas by public utilities.

Under the terms set out in the bill, the commission would be given power to enter municipalities and make appraisals of gas distribution systems. This authority is denied under the present statutes, the commission at the present time having only authority to appraise the properties of the utility companies as far as the city limits.

The bill would also make it mandatory on gas companies serving unincorporated towns of less than 500 population to file proposed changes in rates with the commission before making the rates effective. Existing statutes give the commission only the right to review the rates and do not require that they be approved by the State regulatory body before being placed into effect.

American Gas & Electric Earnings

American Gas and Electric reports balance of $15,891,017 for interest and dividends for twelve months ended August 31, against $20,961,282 in the preceding twelve months. After deduction of interest and other charges amounting to $2,593,426, balance of net income remaining amounted to $13,297,590, equivalent after $6 preferred dividend to $2.69 a share on 4,146,168 common shares. These results compare with net income of $18,120,570, or $4.01 a share on the common stock for twelve months ended August 31, 1931. At that time 3,986,228 shares were outstanding. August balance after interest and preferred dividends totaled $486,240, against $887,925 in August, 1931.

39th Annual Meeting of A.S.H.V.E.

The time and place of the 39th Annual Meeting of the American Society of Heating and Ventilating Engineers has been announced by the Council of the Society. The meeting will be held at the Hotel Gibson, Cincinnati, Ohio, January 23-25, 1933, under the auspices of the recently organized Cincinnati Chapter. President F. B. Rowley, Director of Experimental Engineering Laboratories at the University of Minnesota, will preside when the meeting is opened Monday, January 23.

The program provides for morning and afternoon sessions, beginning on Monday, January 23, and a number of research and technical papers, reports of the officers and committees will be given and considerable time will be devoted to discussion of revision of the Constitution and By-Laws.

A preliminary program has been prepared and copies may be obtained from the secretary of the Society, A. V. Hutchinson, 51 Madison Ave., New York, N. Y.

Consolidated Gas Electric Light & Power of Baltimore Purchase Annapolis and Chesapeake Bay Power Co.

Pursuant to a decree of the U. S. District Court of Maryland, the property, franchises and business, both gas and electric, of The Annapolis and Chesapeake Bay Power Company were auctioned at a Receiver's Sale at the Court House at Annapolis recently.

The Consolidated Gas Electric Light and Power Company of Baltimore, represented by its president, Mr. Herbert A. Wagner, bid $1,900,000 for the property, and purchased it subject to approval of the sale by the Public Service Commission of Maryland and its ratification by the U. S. District Court. The Consolidated Company deposited with the Receiver, Mr. Albert G. Towers, a check for $100,000 as required by the decree of the Court of all bidders for the property. There were no other bidders.

All of the assets, property and franchises were offered by the Receiver as an entirety and subject to the lien of the $1,428,000 first mortgage bonds of The Annapolis and Chesapeake Bay Power Company. The purchaser assumes this mortgage indebtedness as well as the indebtedness of The Annapolis and Chesapeake Bay Power Company to the Mayor and City Council of Laurel, Md., in the sum of $37,500, payable without interest in installments of $2,500 each on the first day of July in each year from 1933 to 1947.

The Annapolis and Chesapeake Bay Power Company serves 13,132 electric customers in Anne Arundel, Prince Georges, Calvert, Howard and Montgomery counties, Maryland. The property sold includes no electric generating plant, the current distributed being purchased from the Consolidated Gas Electric Light and Power Company of Baltimore and the Washington, Baltimore and Annapolis Electric Railroad Company. The Annapolis and Chesapeake Bay Power Company supplies gas to 2,326 customers, which is purchased from the Consolidated Gas Electric Light and Power Company of Baltimore.

The territory served includes Annapolis, the Capitol of Maryland and the seat of the United States Naval Academy, and is adjacent to the territory now served by the Consolidated Gas Electric Light and Power Company of Baltimore.

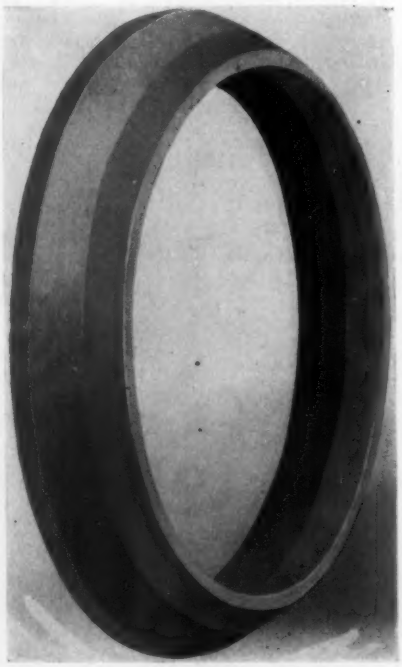
The Gross Operating Revenue of The Annapolis and Chesapeake Bay Power Company for the year 1931 was $932,349. All of the stock of The Annapolis and Chesapeake Bay Power Company is owned by the Washington, Baltimore and Annapolis Electric Railroad Company which is now in the hands of a receiver.

New Equipment & Appliance Section

In This Section Will Be Found Descriptions of New and Improved Gas Plant, Distribution Equipment, Accessories and Domestic and Industrial Appliances

Some Recent American Cast Iron Pipe Company Developments

Simplex Thiokol-Impregnated Duck-Tipped Rubber Gaskets



"Thiokol," manufactured by The American Cast Iron Pipe Co., Birmingham, Ala., is a "synthetic rubber" in many respects superior to native vegetable rubber, especially as regards resistance to the deteriorating action of most liquids and solvents, such as oils, gasoline, drip-oil, etc. It is weather-proof, sun-proof, and apparently age-proof as has been demonstrated by numerous severe tests. "Thiokol" is now employed by Acipco to impregnate "Simplex" gasket tips—thus offering complete protection against solvent action. These gaskets are furnished for use in all Acipco "Simplex" (gland packed) Joints.

CAST IRON ZEC-METAL BOLTS

This is a new bolt, offering the long life of true cast iron plus the strength of steel enabling them to offer 100 per cent cast iron joints for "Simplex" products, including Mono-Cast Doublex Simplex Pipe, Monoloy Doublex Simplex Pipe, Simplex Prepared Joint Pipe, and Simplex Condenser Piping.

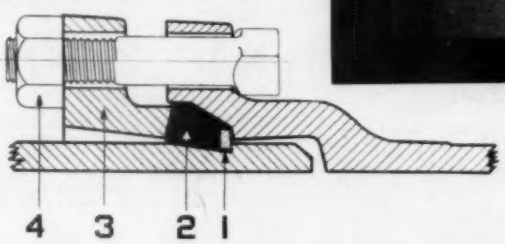
Cast Iron Fusion Weld

The "cast iron fusion weld" is an Acipco development—a process producing a joint which is 100 per cent as strong as the parent metal, equally as flexible, and as highly resistant to shock. The process does not weaken the parent metal adjacent to the weld. It eliminates the possibility of "bi-metallic corrosion" because it is a true cast iron weld, possessing all properties of the parent metal itself. By use of this unique process, Acipco pipe can be welded at the foundry into any length required.

Cast Iron Fusion Weld

Monoloy Centrifugal Cast Iron Pipe

"Monoloy" is a light weight, high strength cast iron pipe made to standard steel and wrought iron pipe outside diameters, and cast from alloy iron to suit varying severe corrosive conditions.



"River-Crossing" Simplex Joint

This joint differs from the familiar Doublex Simplex Joint in that the spigot end is grooved and a retainer ring is used to prevent separation of the joint. Pipe with this joint can be pulled across rivers and streams without fear of joint separation and without sacrifice to flexibility or longitudinal expansion and contraction.

Description of M. A. N. Waterless Holder

The M.A.N. Waterless Gas Holder is a rigid, hollow, steel prism of regular polygonal cross section with from ten to twenty-eight sides depending upon its capacity.

Steel sheets, doubly flanged, riveted together, and in turn riveted to structural steel built-up columns at the corners, form the hollow prism, which has a smooth interior surface and closed off gas tight with a flat bottom of sheet steel. The prism is

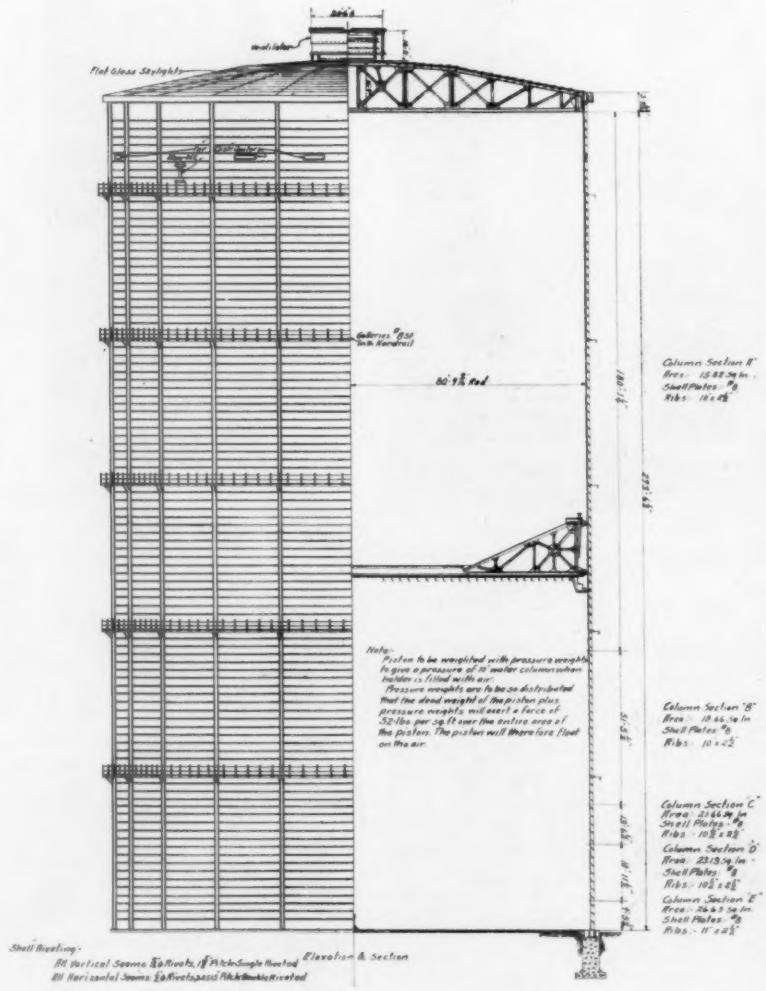
M.A.N. Waterless Holder

covered with a ventilated roof. Enclosed within the prism is a horizontal piston, formed of radially set structural steel trusses, to the bottom chords of which are riveted doubly flanged steel sheets to form a gas tight disc. The piston floats on top of the gas, ascending with the flow of gas into the holder and descending due to its own weight with the withdrawal of gas from the holder. The piston is kept in its horizontal position and guided on its travel up and down the prism by pairs of 12 inch diameter roller bearing rollers, one above the other, attached to the ends of the piston trusses and rolling against each of the corner vertical columns. The vertical distance between these sets of rollers is 1/10 the diameter of the piston for smaller holders and 1/8 the diameter of the piston for larger sized holders.

Tar Cup Makes Contact Inside Shell

Around the perimeter of the piston is provided an annular tar cup, which with a narrow strip of canvas and a flexible steel strip about 1/8 inch by 5 inches, known as the rubbing bar, held in place against the shell by a series of weighted levers, makes a closely fitted contact with the inside of the holder shell. The gas under the piston is completely sealed off from the space above, by a sealing fluid maintained at a determined depth in the afore-described tar cup. The sealing fluid used is generally a high boiling point, low volatile, water gas tar with suitable viscosity.

Tar leaking out of the cup and past the rubbing bar will trickle into another annular trough called the dam, which extends around the entire inside of the shell at the bottom of the holder. A quantity of sealing fluid is maintained in this dam at a constant depth controlled by a number of over-flow weirs equally spaced around the perimeter of the holder, each of which discharges into its own pump tank on the outside of the holder. Any tar entering this dam, such as that trickling down the shell from the cup, will displace an equal amount of tar from the dam into a pump tank. From the pump tanks the tar is pumped aloft through riser pipes by automatically controlled, electrically driven, silent, gear pumps, to distributor boxes located above the uppermost limit of the piston travel. From the distributors it flows slowly down the inside of the shell back into the cup from whence it came.



Near the top of the holder and below the uppermost travel of the piston is provided a series of blow-off pipes to prevent building up excessive pressure should gas continue to be admitted after the piston has reached its uppermost limit. Attached to the under side of the piston and directly over the gas outlet pipes are plates which will seal off the outlets and prevent a vacuum being created in case all the gas is withdrawn from the holder to guard the holder against remotely possible operating mishaps. An accurate gauge board, indicates the volume of gas in the holder at all times.

Enclosed Hoist

The space above the piston is reached by means of stairs or an enclosed hoist running from the ground to the top of the holder on the outside and by means of either a double, collapsible safety ladder or an electrically operated hoist running from the top of the holder to the top of the piston on the inside. The space above the piston is ventilated by a ring of weather protected ventilating holes under the eaves of the roof and by a special ventilator on the top of the roof. This space is lighted by a number of glass skylights in the roof or by vapor proof flood lights set in the roof.

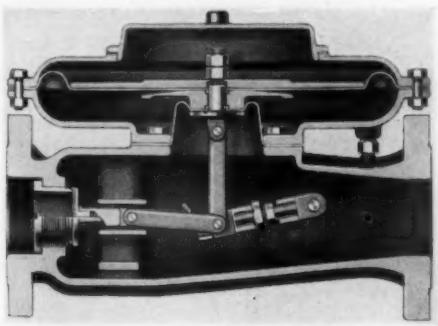
About every fifty feet up the outside of the holder and accessible from the stairway and outside hoist, are galleries. These galleries permit inspection of the outside of the holder shell and facilitate painting.

Reynold's Regulators Cover Varied Pressure Combinations

These Regulators are designated as No. R-8100-B-18, No. R-8100-B-20, No. R-8100-B-21 in the No. 1 size; and No. R-8300-B-18,, No. R-8300-B-21, in the No. 3 size. They are generally termed Model 30 Series for pounds to pounds pressure. They are very satisfactory regulators for industrial use where the gas is used at the burner under pounds pressure. They are also a satisfactory regulator to use off a high pressure tap for double reduction in pressure. They can be used on the first reduction, provided the inlet pressure does not exceed 150 lbs., and the outlet pressure desired is from 10 to 20 lbs.

For Pounds to Pounds Pressure

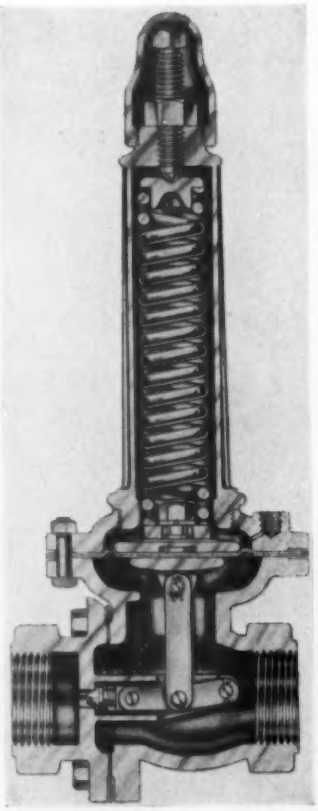
These Model 30 Regulators, spring type, can be furnished in No. 1 size for maximum outlet pressure of 35 lbs.; No. R-8100-B-18 for 1 to 5 lbs., No. R-8100-B-20, 5 to 35 lbs., and the No. 3 size for a maximum outlet pressure of 25 lbs. The dead weight type is usually not used where the outlet pressure exceeds 10 or 12 lbs.



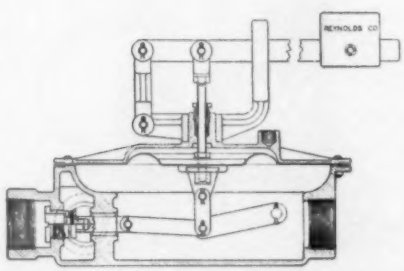
The No. 3 size is for small town border regulation where the inlet pressure would be up to 100 or 150 lbs., with an outlet pressure up to 25 lbs., as desired.

The No. 1 is made with ¾", 1" or 1¼" connections or any combination of these connections. The No. 3 is built with 1½" or 2" connections or any combination of these connections. Both sizes are manufactured in either spring or dead weight type. The illustrations on this page show both types.

This new Model has been tested and tried in actual service for more than a year. It is designed with ample factors of safety for handling pressures up to 1,000 pounds, reducing same to pounds. The feature of this Regulator is the bronze casting on the inlet side which assures that there is no high pressure or inlet gas against the cast iron body. The inlet connection, complete with pipe connection and fixed fulcrum, is a one-piece bronze casting. This arrangement eliminates outside connections and the possibility of leaks where the toggle pin goes through. With the toggle a part of the bronze casting, pressure on the toggle will not push it away from the cast iron body to which it is bolted.



New Half-Ton Regulator



The valve on the new Half Ton Regulator is designed so that it can be adjusted to and from the face of the orifice for changing angle of toggle when desired.

New Model 30, Flanged Type, High Pressure Regulator

This type of Regulator is manufactured in either 2 x 2", 2 x 3", or 3 x 3" connections, complete with companion flanges. It has been in actual service since the first of this year. The toggle levers are made from a stainless steel, with the exception of the back link which is made from bronze.

The new Model 30, Flanged Type, has a removable valve pocket which can be taken out through the side hand-hole plate when it is necessary to renew the valve seat.

Has Removable Brass Orifice

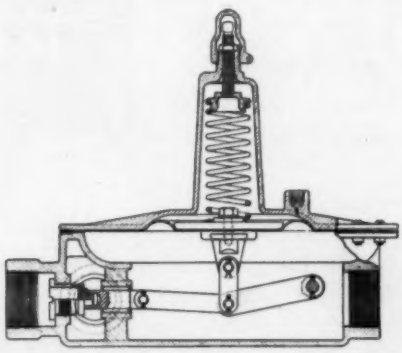
Also, this Model is furnished with a removable orifice which is made of brass. These orifices are various sizes.

A small diaphragm under the center of the main diaphragm prevents the gas from having access to the main diaphragm until it is stream-lined in the outlet throat. Stream lining in this way increases the capacity of the Regulator. This also permits round-the-corner control, or remote control, if desired.

The body of the Regulator is designed so that the moment the gas leaves the face of the orifice it is completely released and stream-lined through the body.

Operates On Inlet Pressures Up to 150 Lbs.

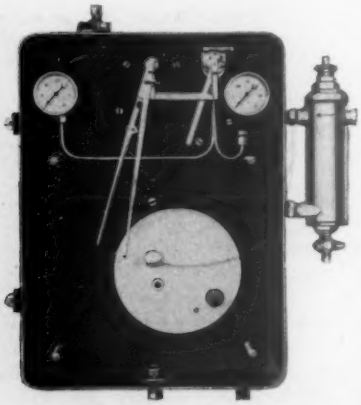
These Regulators will operate on inlet pressures up to 150 lb., and are arranged for regulation of pressure to inches, ounces or pounds, according to conditions. They are built in either spring or dead weight types.



The new Model 30, Flanged Type, High Pressure Regulator and other types described are manufactured by the Reynolds Gas Regulator Company, Anderson, Indiana, U. S. A.

American Meter Brings Out Metric Rotary Pilot Valve

The new Metric Rotary Pilot Valve has been designed to produce simplification and a new economy in rate—volume control. There is no continuous leak. At the control point no gas or air is admitted to the diaphragm head of the controlled valve and no gas or air is discharged to the atmosphere. The rate at which gas or air from the diaphragm head of the controlled valve is discharged is automatically adjusted according to flowing conditions and the amount of gas or air consumed is reduced to a minimum of less than three cubic feet per hour.



Metric Rotary Pilot Valve

A single adjustment operated by a micrometer screw increases or decreases the time element. By making another adjustment, the action of the pilot valve may be made suitable for use with an open type or a closed type controlled valve. All adjustments are made without removing chart.

Rate Volume Control

The Metric pilot valve is simple in design, consisting of a housing, sleeve, valve seat, and valve. There is no capacity tank or adjustable leak. Bulletin E-5 explains the Metric Rotary Pilot Valve Controlled Valve and other features of this equipment. Copy on request.

Base Pressure Index

Metric Integrating Orifice and Flow Meters

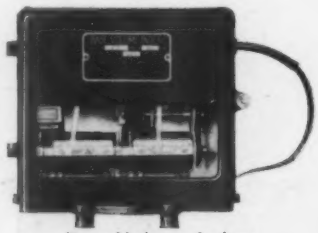
The Westcott Integrating Orifice Meter is the Westcott Orifice Meter equipped with an integrator which gives a totalized indication of the quantity which has passed through the orifice for all rates of flow and all variations of pressure. The Metric Integrating Flowmeter is the Westcott Orifice Meter without pressure spring, equipped with an integrator which gives a totalized indication of the quantity of gas or steam at constant pressure or of liquids which pass through the meter regardless of the rate.

5-B 150 Ironcase Meter

Ironcase Meter Developments

In general form and in details the Metric Ironcase Meter has been designed to give accuracy and long service at low annual cost, according to the manufacturers. For instance, in the casing a selected gray iron is used. This resists for a long period any damage from the corrosive action of injurious gas constituents. For double protection a special Bakelite coating—scientifically applied by skilled operators to the inside and outside of every case—is added.

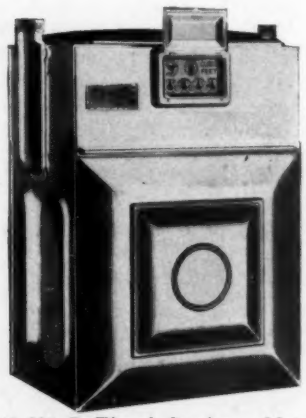
Ironcase Meters are designed on the principle that gas never passes through a seamless fine grain iron casting. Hence,



Base Volume Index

table, partition, outlet channel, and diaphragm channels of every Ironcase Meter are cast in one piece. Seams in Ironcase Meters occur only in exposed portions of the case and every precaution is taken to make them leakproof. Special cork gaskets are used that remain resilient to allow for difference in expansion from temperature changes, for freedom from development of leaks and avoiding the use of paste preparations. The cap screws of high pressure meters, have a tensile strength of 160,000 pounds per square inch. Similar precaution has been taken with valves and seats. They are cast with exactness and uniformity, and are ground to make them gas tight.

Complete literature is available on request. Consultation is invited with American Meter Company engineers on any gas measuring control or regulating problem which may arise.



10-300 B Timed Steelcase Meter

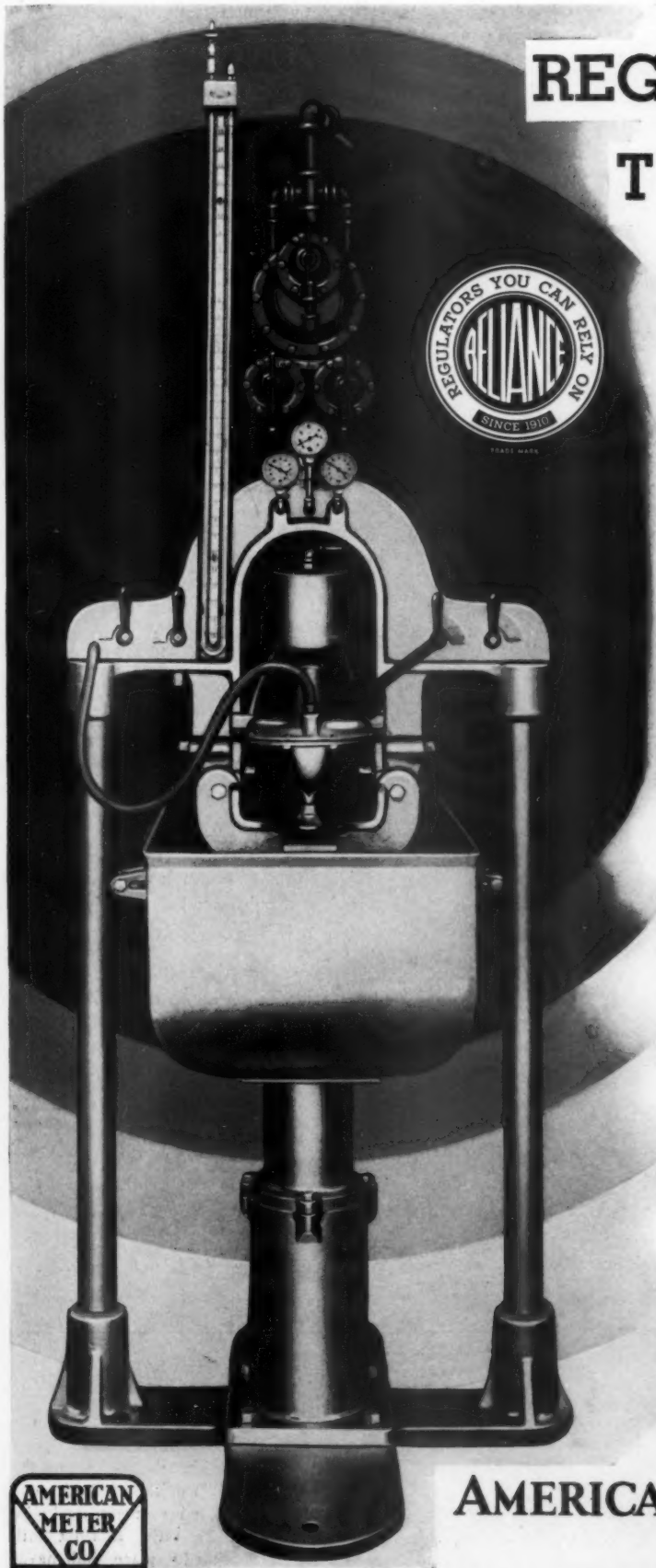
American Meter Company through research, test and experimentation has improved in Tinned Steelcase Meter. Standardized methods of analysis for both leather and oil have enabled that company to produce diaphragms to effectively meet varying conditions. Fact finding experiments are continuously under way, state company officials. New metals, and Bakelite have been adopted for parts which could be improved by these innovations, to meet specific conditions. The entire design has been subjected to repeated test for even the slightest possible improvement, according to company engineers. Manufacturing methods have received the same study. These and other developments are described in Bulletin TG-4.

Base Pressure and Volume Index

The Metric base pressure index gives a totalized reading of the quantity of gas which has passed through the meter in cubic feet (at the base pressure). Each cubic foot (actual volume at line pressure) is multiplied by the factor for line pressure.

The Metric base volume index registers the total quantity of gas which has passed through the meter in cubic feet at standard conditions of base temperature and base pressure. Each cubic foot (actual volume at line pressure) is multiplied by the factor for flowing temperature, and this product is subsequently multiplied by the factor for line pressure.

Either type of index is furnished with a supplementary counter in the rear which gives a reading of the actual volume of gas at line pressure. This information is required when the volume and pressure gage is used. Any volume and pressure gage supplied by the American Meter Company can be readily installed on the top of the base pressure index or the base volume index, and the chart from this gage will serve as a permanent record of the rate of flow and pressure. It can be used as a check reading if desired.



REGULATOR TESTING SIMPLIFIED

USERS of Reliance Regulators know the perfection with which the instruments have gone into service year after year without factory faults.

Here is the machine that has recently been developed to facilitate our own testing — and it is now available for your use in your own shop.

RELIANCE REGULATOR TESTING MACHINE

—Used in connection with a large regulator repair shop and for periodic inspection and adjustment, it can save its first cost in a very few months.

Easy, economic, accurate testing and adjusting, for both body and diaphragm leaks on Reliance Types G, GC, H and B, and almost any other standard regulator in sizes from ¾" to 1½" inclusive. For use with the larger 2" size, special reservoirs and heads are required. Check pressure and flow pressure can be set and observed, followed by positive determination of lock-up pressure.

Prices and details available on request.

AMERICAN METER CO
MEASUREMENT ENGINEERS
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ESTABLISHED 1836

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2164

A Builder of Gas Holders Speaks of New Developments

by Staff Member, the Cruse-Kemper Company

Though the builder of Gas Holders and other major equipment units can rarely startle the Gas Industry with revolutionizing inventions for the storage and processing of gas, he constantly has opportunity for developing modifications in his technique and in the details of design and erection—modifications which result in improvements in the structures themselves and in their service. As will be seen in the examples to be cited, the changes may be small in themselves, but their sum total in any new installation is great enough in importance to influence for the purchaser both the initial cost and the yearly charges for operation and maintenance.

Efforts to build new units that will cost less to erect and to operate, are explained with the thought that there must be other organizations, within the industry, constantly working to the same end. The Cruse-Kemper Company in fact, sees the necessity for this effort as being of such fundamental value both to the purchaser and to the builder that, for any builder who aims to progress in the industry, the effort must be the primary occupation of his engineering and research staffs. Certainly an organization building units that cost some hundreds of thousands of dollars initially, owes it to itself, and to the industry, to find every possible means by which the purchaser can get the most service for his money.

That last phrase about the purchaser getting the ultimate in value is quite carefully worded. The Company's policy is not to find ways of building Holders of the lowest initial cost. It is to discover, through study, the means of building that Holder which best fits the purchaser's needs, which at the same time costs the minimum for its quality.

But let us look at specific examples. For one, let us take a small angle-bracket used to support the deck. It looks like a good bracket, strong enough, angled correctly; once put in place it will do its work. The engineer looks at it, asks himself whether it is as good as it could be. What about its making a small crevice when bolted or riveted in place? What about this depression in the upper surface; won't that form a pocket and collect water, tend to give corrosion a good start? Right there begins the redesigning of that bracket for water-shedding and tight fitting. Right there starts a saving in the yearly charges for keeping the structure, on which it is placed, in good condition.

A second example, gives perhaps a better illustration how maintenance costs can be kept to the lowest level. Though inspection schedules vary widely according to climatic conditions, public utilities spend money, semi-monthly or monthly, sending engineers or assistants to examine the exposed surfaces of their Holders. No small part of the money goes in inspecting the sheets that form water cups and grips. These sheets, as every maintenance engineer knows are subject to frequent changes in water and air exposure—a condition which, left to itself, leads to rapid corrosion. Unless the Holder-builder has foreseen the threat to shortened life for these sheets and has incorporated structural features designed to prolong it, the company operating the Holder is going to spend money needlessly in inspection, repairs and replacements. By thickening all cup and grip plates the original material can be counted on for longest use with minimum expenditure for up-keep.

Scores of similar examples might be given in which there is a direct relationship between the research carried on by the Holder-builder and the purchaser's gain of lowest Holder-cost per year of use. Each one would tend to substantiate the rightness of the efforts to find better ways of performing each step of design and erection.

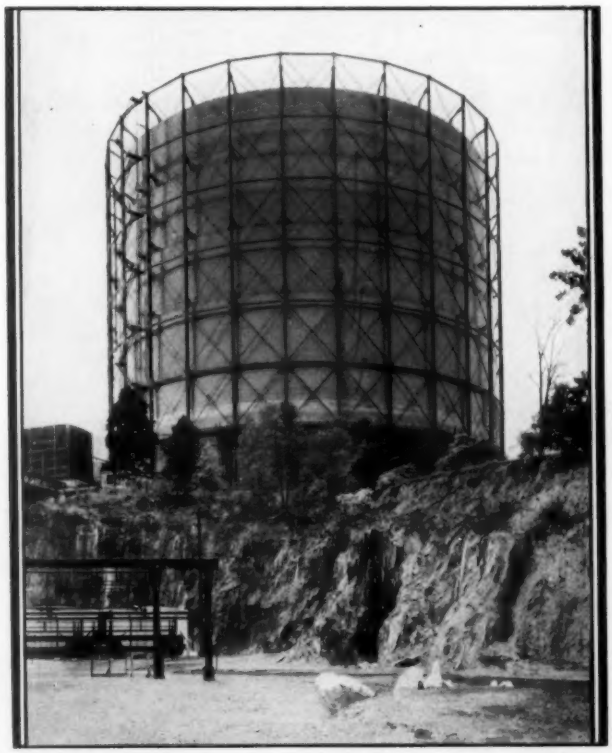
A case in point comes as news from Puerto Rico, where only a few days ago a hurricane raged with terrific wind velocity. A Cruse-Kemper Holder was in that storm and withstood the winds, doing its part in maintaining gas service under conditions which stopped the supply, according to newspaper accounts, of water and electricity. Another credit to the engineering research which makes Gas Holders so substantial that tropical storms cause no damage.

The whole principle, as presented here, has another angle of importance. The Gas Industry is seeking lower manufacturing costs. The effort is so strenuous, in fact, that the purchase of new equipment is being influenced. Purchaser's eyes are looking to first-costs with perhaps too little attention to the value of "lowest cost per year of use." It is the latter which will be of greatest help in getting down the price of gas.

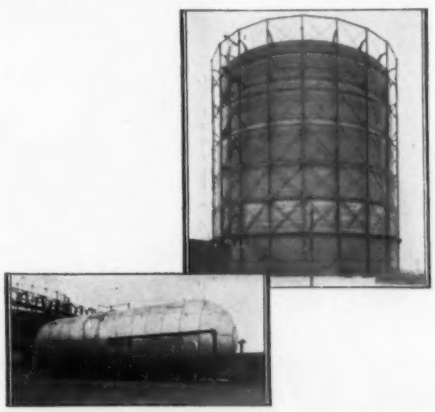
Worth More Than a Passing Thought

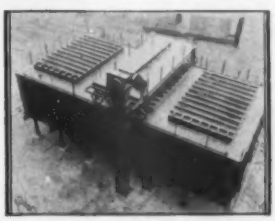
It is not the timid critic that counts; not the man who points out how the strong man stumbled, or where the doer of deeds could have done them better. The credit belongs to the man who is actually in the arena; whose face is marred by dust and sweat and blood; who strives valiantly, who errs and falls short again and again, because there is no effort without error and shortcomings; who does actually strive to do the deed; who knows the great enthusiasm, the great devotion, spends himself in a worthy cause; who at the best knows in the end the triumph of high achievement; and who at the worst, if he fails, at least fails while daring, so that his place shall never be with those cold and timid souls who know neither victory nor defeat.

—*Author Unknown.*



Built up to the best of standards . . . kept down to a predetermined price





Manufacturers of GAS HOLDERS and other major equipment units for the GAS INDUSTRY

The recently completed Holder, pictured above, is an example of Cruse-Kemper's achievement in building to the highest possible standard of quality while keeping purchaser's costs gratifyingly low.

Years of specialization, years of gathering engineering skill in working almost exclusively with the problems of the Gas Industry, have prepared us for such achievements in reconciling quality and price.

We find today a still less costly method of getting a big plate in position. Yesterday we finished a new machine to turn out a sheet in half the operations formerly required. We are constantly finding little ways of saving time and money, of so performing each step of design, fabrication and erection that the best of results are gained.

Finished jobs by Cruse-Kemper have a way of being gas-tight. Records for low cost of operation and maintenance show on purchasers' books.

CRUSE-KEMPER CO.

AMBLER, PA.

Measurement and Control Instruments

Anti-Ambi Thermometer

The Foxboro Anti-Ambi Thermometer is designed for extreme accuracy of Gas Temperature Measurement.

The readings of this instrument are not affected by the temperature surrounding the case and tubing or by any other external force such as barometric pressure or elevation of bulb. It is fully

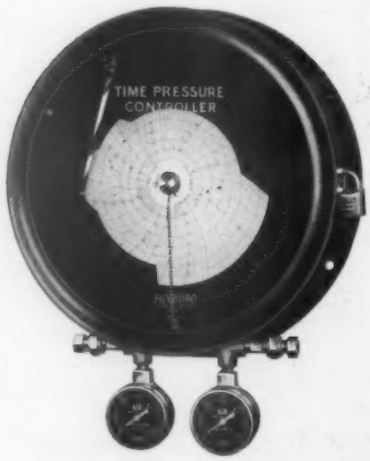
compensated and records true bulb temperatures day and night and designed to record under any climatic condition. The Anti-Ambi Thermometer is built on an old principle long used by the Foxboro Company for medical and laboratory purposes. It is an accurate long-distance recording thermometer for temperatures below 250°F. The extremely small sensitive bulb makes it possible to use the instrument on any size of gas line. A non-conducting stainless extension on the bulb and a fin-type socket prevent the pipe wall temperatures from reaching the sensitive portion of the bulb. The Anti-Ambi Thermometer is rugged in construction and will withstand the most field use. A complete description of this instrument may be obtained by writing for Foxboro Bulletin No. 178.

Bell Type Meter

Large volumes of gas at low pressures can be measured with the new Foxboro Bell-Type Meter. A single meter of this type is said to be capable of measuring as much gas as a whole battery of Positive Meters. Should the flow conditions change and a meter of greater capacity be required, the same Bell-Type Meter can be adapted to the new conditions by installing the correct orifice plate. The compactness of this instrument is said to enable large savings on meter house construction. Its calibration is built into it at the factory. If the instrument calibrates correctly at zero and the top of the scale, it is also correct at all intermediate points. This meter is recommended by the Foxboro Company, Foxboro, Mass., for pressures of 25" or under.

Pressure Sensitizer

The Pressure Sensitizer is a gas operated control instrument designed to give automatically perfect pressure regulation on gas distribution. The Sensitizer can be used with present regulators. A diaphragm motor lever controlled by a pressure sensitive element, raises or lowers the regulator arm just as an operator would. Furthermore, the control mechanism is so designed that it can move the valve from open to



closed position without appreciably changing the control point. This eliminates "pumping" entirely and gives absolute control.

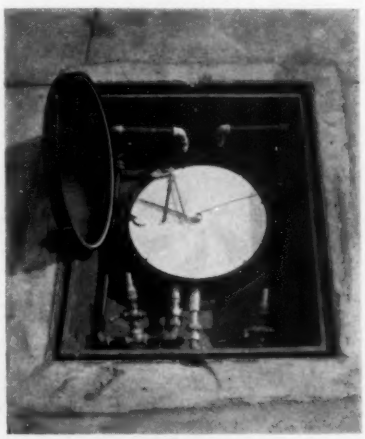
The automatic time Sensitizer is equipped with a time cam that changes the line pressure according to predetermined load requirements. The cam is a round aluminum disc with standard Foxboro chart graduations. The pressure schedules can be cut by the user with a pair of shears and a file. Where a wide variety of schedules are desired operator can stock the calibrated discs and cut his own cams. Complete information is given in Bulletin No. 594.

Pressure Governor Gauge

This instrument gives a complete check on pressure governor operation. Its design is such that it is adaptable to either curb box or manhole installations.

Gas Saturation Controller

In the Foxboro Gas Saturation Controller, the per cent saturation control point is set automatically by the gas line temperature. This is designed to insure correct saturation at all times, regardless of temperature changes.

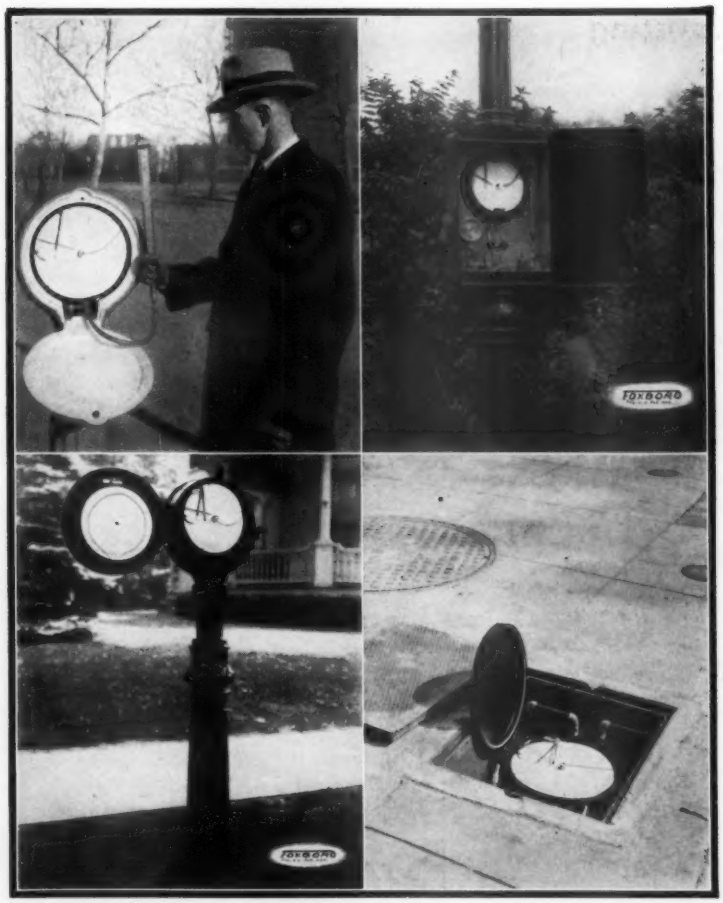


The operating principle of this instrument is based on the well-known wet and dry bulb system that has been used for many years to indicate, record, and control relative humidity. A powerful, positive acting, pressure motor is used to reset the saturation point.

The Saturation Controller may be operated on air or gas at a pressure of 2 pounds per sq. in. or over. The Controller Valve is furnished with a pressure-tight relief chamber. Should the diaphragm leak the gas passes into this chamber and is conveyed through piping to a safe spilling point.

the Saturation Controller can be obtained by writing for Bulletin No. 179.

Complete engineering information on This bulletin also contains the Universal Relative Humidity Nomograph for determining the per cent saturation for any gas.



DOWN OR UP ON THE CURB

● Foxboro Recording Gauges are a paying investment whether up or down on the curb. They furnish an accurate check on pressure governor operation and thus eliminate losses caused by incorrect regulation.

● The Two-Pen Pressure Governor Gauge records both high and reduced pressures accurately on one chart. This means a single instrument that is economical in operation and adaptable to curb box as well as manhole installations.

● Foxboro has made horizontal manhole installations practiced by the use of a jeweled bearing that eliminates friction and insures continuous accuracy. All Foxboro Instruments are designed and engineered to give maximum service with minimum servicing.

● Faulty governor operation will cut down profits on your heavy winter loads. There is still time to install Foxboro Pressure Governor Gauges before cold weather. Act today—write for prices—no obligation.

FOXBORO
REG. U. S. PAT. OFF.
THE COMPASS OF INDUSTRY

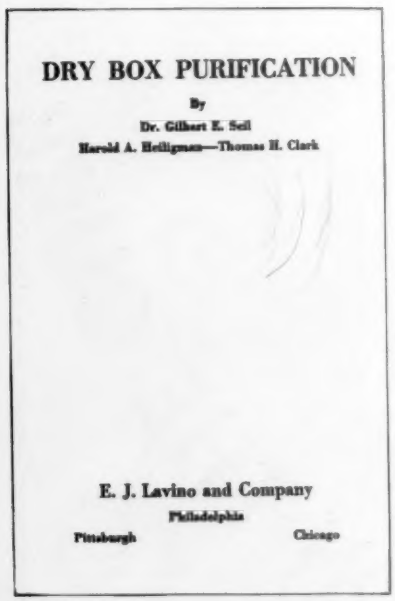
THE FOXBORO COMPANY
Neponset Ave., Foxboro, Mass., U. S. A.
BRANCH OFFICES IN THE PRINCIPAL CITIES

●● COMPLETE INSTRUMENTATION FOR GAS DISTRIBUTION ●●

Lavino Issues Three Interesting Books On Purification

Dry Box Purification

This booklet considers purification in all its aspects and covers the problem of purification as a whole in a clear and concise manner and should be of value to anyone interested in dry box purification.



The following table of contents will give some idea of the scope of this work.

Part I—Selection of the Purifying Material
Capacity
Theoretical Capacity, definition of
Actual Capacity, definition of
Activity
Evaluation of Gas Purifying Materials
Method of Evaluation
Preparation of the Sample
Procedure
Necessary Analytical Data
Method of Obtaining Data
Percentage Fouling, determination of
Revivification, rate of
Interpretation of Results
Flexibility of the Apparatus

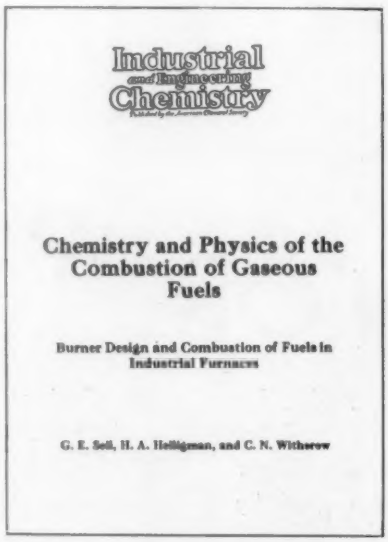
Part II—The Manufacture of Sponge

Part III—Preferred Method of Packing a Box

Part IV—General Plant Practice
Temperature Measurements and What They Mean
Significance of Humidity Measurements
The Function of Water
The Necessity of a Potential Alkali
Effect of Poor Tar Removal
Revivification
Rotation of Boxes

Chemistry and Physics of the Combustion of Gaseous Fuels

The reasons for desiring to control the chemical constituents of the furnace atmosphere are discussed. The chemical and physical effects of excess carbon monoxide, excess oxygen, neutral atmosphere, and varying atmosphere are enumerated. The atmosphere in gas-fired tunnel and periodic kilns is traced throughout the burn and compared with coal-fired kilns. Control of kiln atmosphere when using solid, liquid, and gaseous fuels is discussed.


Industrial and Engineering Chemistry
Chemistry and Physics of the Combustion of Gaseous Fuels
Burner Design and Combustion of Fuels in Industrial Furnaces
G. E. Seil, H. A. Heiligman, and C. N. Witherow

Various methods of burning gas industrially are described, with a full discussion of an annular orifice type burner. Curves and experimental data on producer gas, city gas, and oil burning are shown.

Chemical Analysis of Gas Purifying Materials

As is evident by the title this book describes methods for analyzing gas purifying materials.

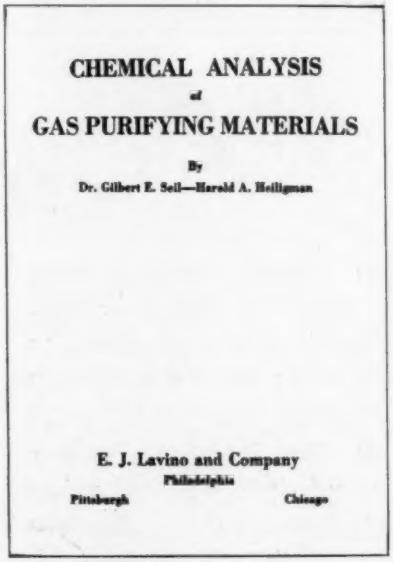
Samples of gas purifying materials submitted to the laboratory for chemical analysis are divided into three classes and the following outline indicates the determinations usually made.

I OXIDES

(a) Moisture
(b) Fe_2O_3
(c) Total CaO
(d) Active Alkalinity
(e) Total Alkalinity
(f) CO_2
(g) Total Na_2O

II UNUSED SPONGE

(a) Moisture
(b) Fe_2O_3
(c) Percent oxide in sponge



III USED SPONGE

(a) Fe_2O_3
(b) Total S
(c) Free Sulphur and Tar
(d) Light Oils
(e) Napthalene

Methods which have been found practical and accurate for making the above determinations are given completely.

When purchasing purifying materials the chief feature to be considered is the cost per pound of Sulphur removed.

Whether your purification plant is under or over capacity, whether the H_2S content of the gas is high or low, whether the gas contains excess oxygen or the reverse, all of these have a bearing on the cost per pound of Sulphur removed, but to obtain the lowest purification costs irrespective of these and other conditions, requires a material having the greatest attainable activity or in other words the ability to react with H_2S regardless of the rate of flow through the boxes and the amount of H_2S present.

LAVINO ACTIVATED OXIDE is such a product. It was developed to give the maximum service under any and all operating conditions and is manufactured in the United States for the soie purpose of Gas Purification.

This material contains from 63% to 68% ACTIVE Fe_2O_3 "as received basis" which means that the consumer receives from 1260 pounds to 1360 pounds of ACTIVE PURIFYING MATERIAL in every ton purchased. A Gas Purifying Material with such a high percentage of ACTIVE Fe_2O_3 "as received" has never before been available to the Gas Industry and the cost of the ACTIVE MATERIAL present in a ton of Gas Purifying Material as delivered to the consumer should be given consideration when purchasing.

As is well known, one pound of ACTIVE Fe_2O_3 will remove 0.64 pounds of Sulphur in one fouling when oxygen is not employed. With the introduction of oxygen a second reaction takes place increasing the amount of Sulphur absorbed per fouling. It is apparent, therefore, that the more ACTIVE Fe_2O_3 present in the material the greater the amount of Sulphur which will be absorbed.

The removal of traces of H_2S is often a problem. A material may function satisfactorily when the gas contains high concentrations of H_2S, yet show little or no efficiency for the removal of low concentrations.

LAVINO ACTIVATED OXIDE will lower your purification costs whether your capacity is large or small, regardless of the H_2S concentration of your gas or the amount of oxygen present.

Due to the high ACTIVE Fe_2O_3 content of LAVINO ACTIVATED OXIDE the amount required per bushel can be reduced 50% or more.

LAVINO ACTIVATED OXIDE is also available in the form of Sponge for plants desiring to purchase the ready mixed article.

We will be glad to furnish without charge Purification Log Sheets which will enable you to keep a complete record of the performance of each box and the cost of purification.

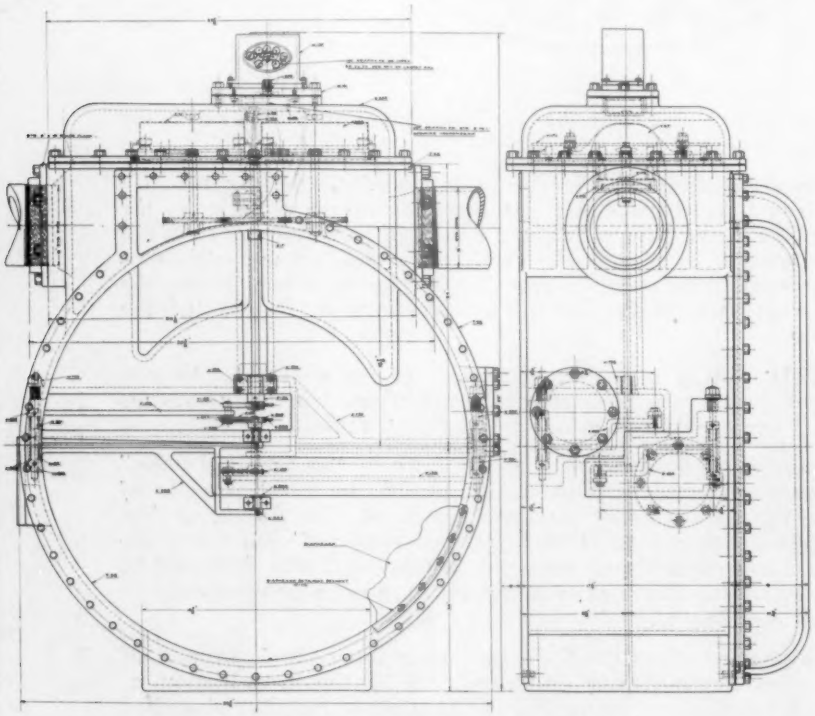
E. J. LAVINO and COMPANY

BULLITT BLDG. - PHILADELPHIA, PA.

CHICAGO **PITTSBURGH**

The Largest Capacity Positive Displacement Meter in the World

Undoubtedly the largest capacity positive displacement meter in the world has been developed and is being manufactured by the Sprague Meter Company of Bridgeport, Connecticut. During the lull in general business this company has spent considerable time and money in bringing forth a meter that will be of considerable importance to the Gas Industry.



Diagrammatic Illustration of No. 20 Meter

Size and Capacity

The meter weighs approximately one ton, takes up about 4 x 3 feet of floor space—the actual dimensions of the meter being 42″ wide, 57″ high, 32″ deep. It is designated as No. 20 and is equipped with 6-inch standard pipe flanges and has a capacity of 15,000 cu. ft. at a ½″ differential, 21,000 cu. ft. at a 1 inch differential and 32,000 cu. ft. at a 2″ differential. One revolution of the tangent equals 18 cu. ft. The index on this meter registers to 100,000,000 cu. ft.

Accuracy

Accuracy of measurement has been attained with flows ranging from that required for a pilot light of a domestic refrigerator to that of industrial demands of over 30,000 cu. ft. per hour.

Construction

This meter is sturdily constructed, handling working pressures up to 75 pounds, and is the acme of simplicity and accessibility. It has less moving parts than any meter on the market which means less wear, less replacement parts, and consequently longer service, which minimizes the possibility of shut down periods. All bearings are self lubricated eliminating attention in this direction and thereby increasing the life of the meter. Such materials as duralumin, graphite-bronze, stainless steel and other non-rusting and non-corrosive materials go into the fabrication of this super-meter. The meter is equipped with a unique "leak-indicator," double adjusted diaphragms and several innovations not to be found in other meters.

Further information may be had on this meter by writing direct to the Sprague Meter Company, Bridgeport, Connecticut.

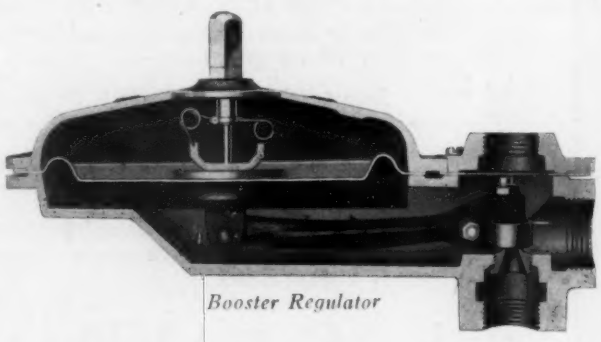
Sprague "Booster" Regulator

For more than twenty-five years the Sprague Meter Company has been manufacturing service regulators. Out of that wealth of engineering experience has been developed a governor of high efficiency, which is known as the Sprague "Booster" Regulator. It is an entirely new feature in gas control and embodies the following advantages:

1. Maintains a constant outlet pressure regardless of the capacity demand. 2. Increased capacity beyond that of a larger size regulator without drop in pressure. 3. Eliminates the necessity of increasing house piping to get desired capacity. 4. Reduces blown seals to a minimum. 5. Removable outlet tail pieces, removable orifices and easy access to valve cap.

In the ordinary spring type regulator the spring tension is the power which helps maintain the outlet pressure of the regulator. This spring tension is limited and, governed by the travel of the diaphragm. In other words, as the diaphragm drops the tension or energy stored in the spring is quickly dissipated and no longer exerts a downward pressure on the diaphragm sufficient to maintain the proper outlet pressure.

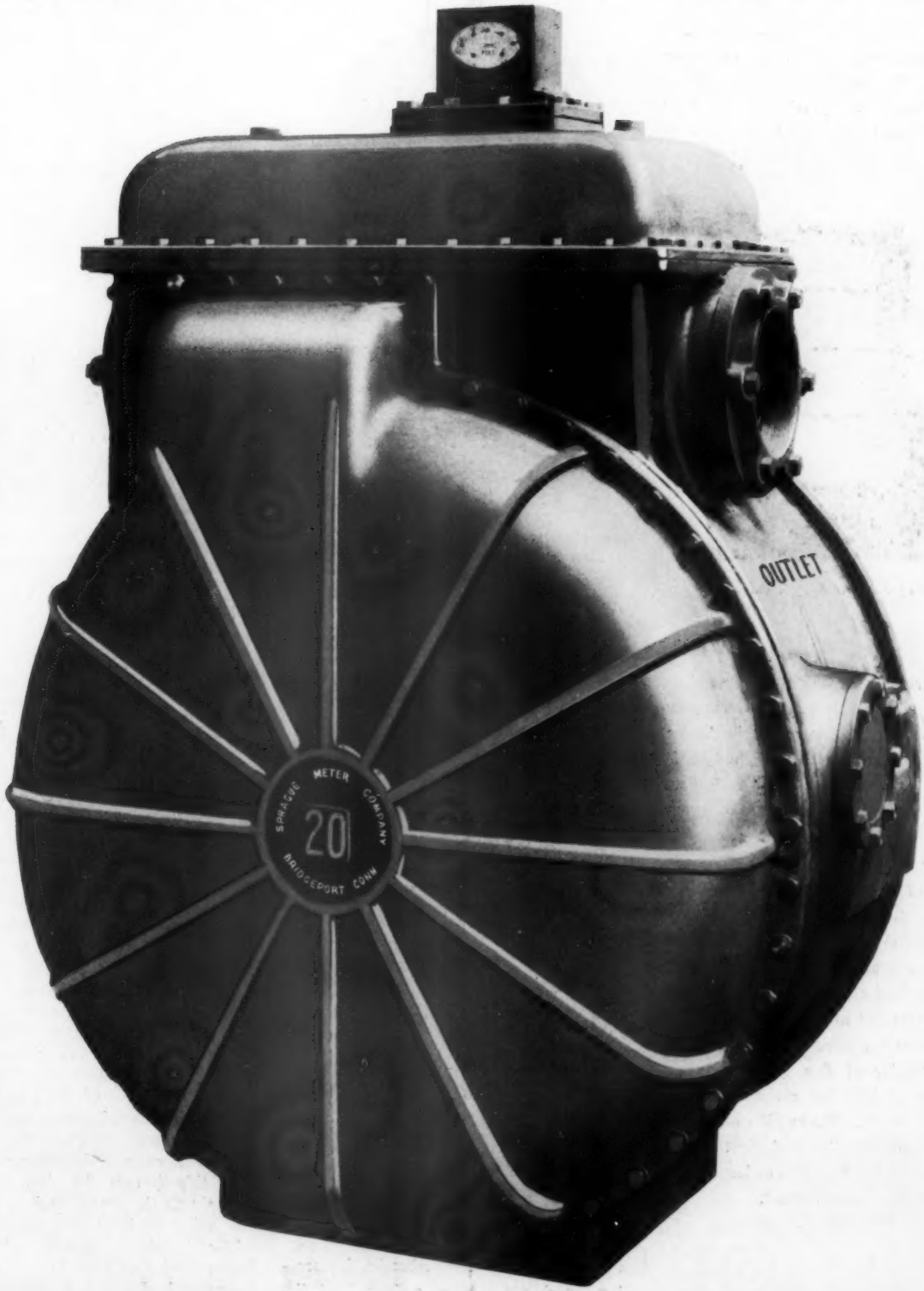
If a constant outlet pressure of say 5″ is to be maintained additional weight would have to be put on the diaphragm as the flow increased. If a burner bar is put at the outlet of the regulator with a number of gas cocks as outlets it would be found that additional weight would have to be put on for each burner turned on in order to maintain a constant 5″ outlet. Eventually the downward pressure would have to be increased from a few ounces at no flow to several pounds at a flow of approximately 600 cu. ft. per hour. The "Booster" device will automatically increase the weight on the fixed diaphragm plate as it travels downward, and diminishes it as it travels upward



Booster Regulator

The power is just reversed from that of the ordinary spring type service regulator. This new "Booster" type of regulator is expected to revolutionize installation problems, according to the Sprague Meter Company.

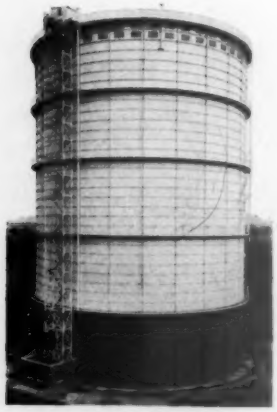
32,000 CU. FT. METER



THE SPRAGUE METER CO.
BRIDGEPORT · CONNECTICUT

Types of Gas Holders Built By Stacey Bros. Gas Construction Co.

After years of development work and experimentation, the firm of August Klonne, Dortmund, Germany, designed and patented a cylindrical gas holder without liquid seal, which is a new type of construction in which the tar and canvas seal with its attendant electric pumps are dispensed with, and wherein the movable piston is rendered gas-tight by a system of packing rings fitted with grease lubricators to reduce friction to a minimum.

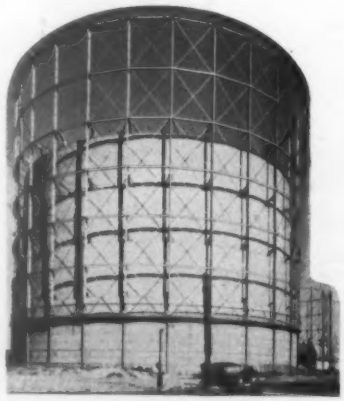


Stacey-Klonne Dry Seal Holder

Over fifty of these holders are now in operation in various parts of the world. As exclusive licensees for the United States, the Stacey Bros. Gas Construction Company has completed this year three large holders of this type: a 1,500,000 cu. ft. holder at Kalamazoo, Mich.; a 4,000,000 cu. ft. holder of this type at Reading, Pa., and a 6,000,000 cu. ft. holder at Syracuse, N. Y. Stacey-Klonne Bulletin No. 35, fully describes and illustrates this new type of holder construction and will be gladly sent upon request.

Stacey Bros. Telescopic Holder

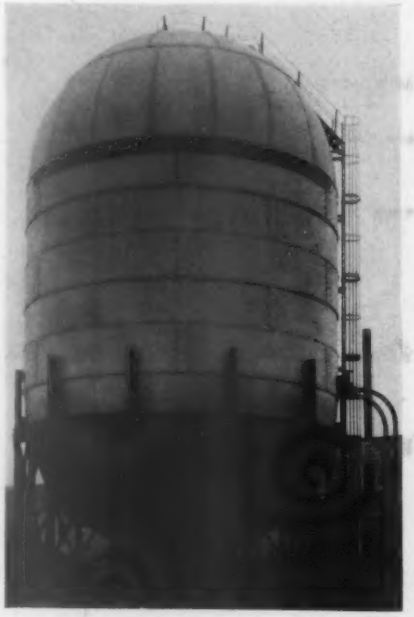
This holder is built from 500 cu. ft. to 15,000,000 cu. ft., or larger. They are in use throughout the world. The manufacturers give particular attention to quality and detail of the joints.



Telescopic Holder

The Stacey "Bullet"

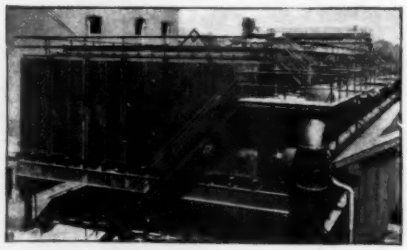
This holder is widely used for reserve storage at the end of branch lines; for storing gas for use during peak loads and as a reserve against line breaks, for serving outlying territories, and on local distribution systems. Stacey "Bullets" are built for pressures up to 100 pounds. Normal operating pressures, however, run from 50 to 60 pounds. "Bullet" holders for higher pressures can be furnished upon specification. These holders are permanently tight as allowance has been made in their design for expansion and contraction without leakage. Stacey "Bullets" may be erected vertically or horizontally. They can be fitted into restricted areas. When placed horizontally they lie low and can be hidden by landscaping in residential districts.



Stacey "Bullet"

Stacey Bros. Purifier

In addition to holders, this company manufactures purifiers, drilling and pumping equipment. Special literature on holders and equipment will be sent upon request to Stacey Bros. Gas Construction Co., Cincinnati, O.



Purifier

Engineering Handbook by New Jersey Gas Association Proves Success

The Engineering Handbook for Building Heating by Gas which was prepared by the Industrial and House Heating Committee of the New Jersey Gas Association, of which H. P. Morehouse, Public Service Electric and Gas Company, Newark, was chairman, has been very favorably received both by representatives of public utility companies and by representatives of manufacturing companies.

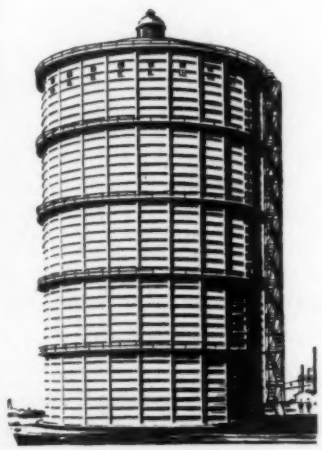
The purpose of this pocket manual, is to provide in one volume the engineering data necessary to figure practically all jobs in the field. It contains 90 pages, with a wide variety of tables and charts.

Although many of the pages are condensed from existing manuals, they have the advantage of presenting the most needed information in compact form and it is this feature that has appealed so strongly to the many engineers who are now using the book.

The handbook includes chapters on Determination of Heat Loss in Buildings; Steam and Hot Water Heating; Warm Air Heating; Estimating Gas Consumption; The Automatic Gas Burner; Domestic Water Heating; Industrial and Commercial Building Heating; Data and Other Fuels; and tables and miscellaneous information.

Keep in Mind

STACEY-KLONNE ADVANTAGES When You Contemplate Holder Construction



1. Lower foundation cost.
2. Less space—more capacity.
3. Constant and relatively high or low pressure as desired.
4. Dry storage.
5. Lower maintenance.
6. Less supervision
7. Less painting.
8. No liquid seal.
9. No pumps or pumping cost.
10. No heating or treating.
11. Easy and accessible to inspect.
12. Economical and practical in all capacities from small to large.

We shall be glad to prove any of these claims and to outline further advantages. Write for Bulletin No. 35.

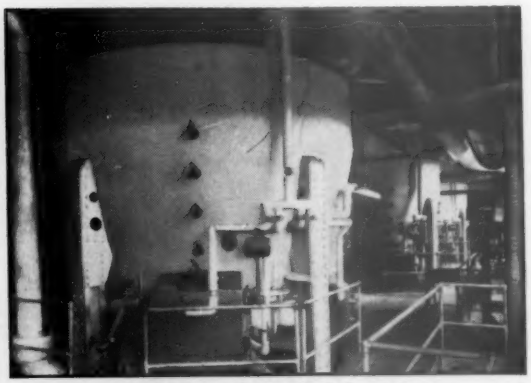
STACEY BROTHERS
GAS CONSTRUCTION CO.
CINCINNATI, OHIO

20 North Wacker Drive
Chicago, Illinois

420 Lexington Avenue
New York City

U. G. I. Equipment and Service Is Varied in Industry

The U. G. I. Mechanical Generator with charger makes for continuous water gas production, as no manual labor is required for clinkering or barring down. The generator shell embodies an annular water vessel which forms part of a steam boiler surrounding the lower portion of the fuel bed, including the clinker adhesion zone. A steam drum is connected directly with this water vessel so that both form a steam boiler. The generator shell above the water jacket is lined with fire brick and insulating material. Grate is of Haug rotating cone stepped type. Bituminous coal may be used as fuel.



U. G. I. Mechanical Generator

Gas Main and Pipe Line Work

U. G. I. employs a large staff of engineers for consulting work in connection with pipe line construction and gas distribution work. The company undertakes the entire construction of a long line, constructing up to 300 miles with its own organization and supervising the construction of the balance. Services are available when natural gas is brought into any locality.

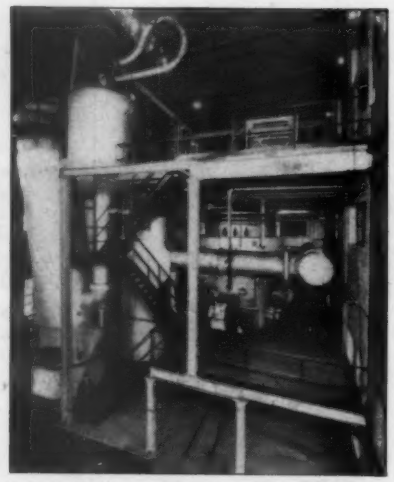
Building 6" Line—Pennsylvania

U. G. I. Pressure Producer

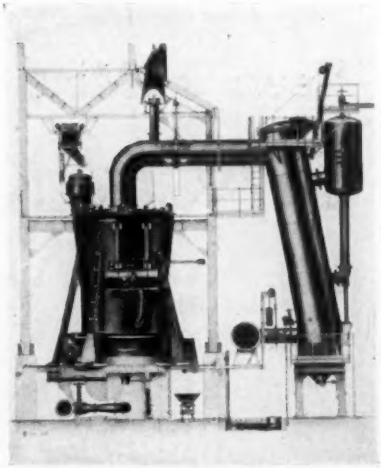
The U. G. I. Pressure Producer is a self-feeding, self-cleaning unit, which may be run continuously with supervision given any live apparatus. Coke of nut size and smaller is fuel. In construction the U. G. I. Pressure Producer is water-jacketed. Heat usually lost is transmitted to the water in the jacket and generated low pressure steam for use in producer itself. Clinker troubles are eliminated in producers by virtue of the water jacket and lack of firebrick lining. The grate is set eccentric to the vertical axis of the producer and is of the step-cone type. This grate revolves and acts as a powerful crushing medium for the ash. An ash plough removes ash without interfering with operation of the producer. Producer gas is used for the heating of carbonizing plants in the steel and ceramic industries and wherever a clean, cool gas having a heating value of approximately 130 B.t.u. is needed.

U. G. I. Carburetted Water Gas Apparatus

U. G. I. ranks among the first of the companies to develop and build up carburetted water gas manufacture. The U. G. I. Heavy Oil Process, using heavy oils for enrichment is said to result in large savings in the cost of manufacture.



U. G. I. Carburetted Water Gas Apparatus



U. G. I. Carburetted Water Gas Apparatus

U. G. I. Vertical Chamber Ovens

U. G. I. Vertical Chamber Ovens are adapted to large as well as small plants. Coal and coke are handled by gravity, without heavy charging or discharging machinery. Coke produced is large in size. Ovens are capable of being steamed to increase capacity and ammonia yield.

U. G. I. Reforming Process

This process was developed by the U. G. I. research organization for reforming natural gas so as to improve the pipe line load factor by varying the amount of finished gas made with a fixed amount of natural gas used and for situations where it is economical to utilize natural gas as a fuel within the set in place of other gas-making fuels. This process can be used with refinery oil gas of high heating value and low gravity. And also for the manufacture of a high hydrogen gas from oil refinery gas or natural gas for use in chemical plants.

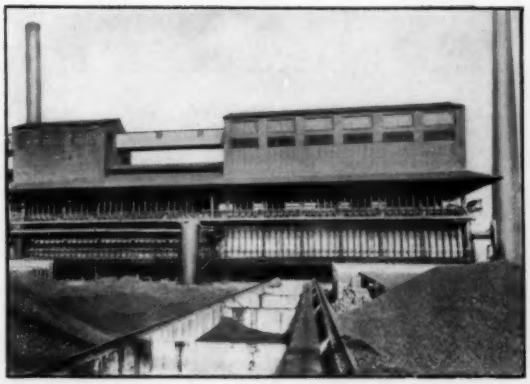
U. G. I. Gas Compressor Installations

Selection, design of proper unit and construction of buildings, foundations and auxiliary equipment is a phase of U. G. I. service. U. G. I. invites inquiries on any problem of construction and design.

U. G. I. Automatic Control Machine

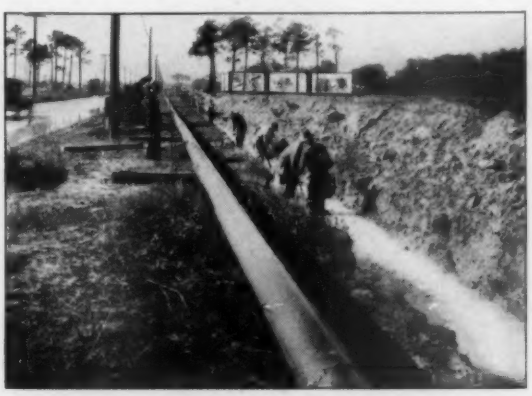
The U. G. I. Automatic Control Machine, fundamentally developed for the operation of water gas machines is also adaptable in any industrial process involving cycle operation of hydraulic valves. It is built as a 6, 7 or 8 valve machine as standard and can be built for a greater number of operations to take care of special uses. It is operated by an electric motor provided with safety features. Levers are provided for manual operation in case of power failure, so machine can be instantly changed from automatic to hand operation.

This enables production to be carried on without interruption.



U. G. I. Products Large in Scope

Among the products not herein described but manufactured by U. G. I. are: Automatic chargers, blue gas and hydrogen gas plants, waste heat boilers, high duty gas condensers, Cottrell electrical precipitators, steam accumulators, cyclonic dust catchers, pier process and service buildings. Complete data on any phase of U. G. I. equipment and service will be forwarded and the assistance of its consulting engineering staff is offered on request to United Engineers and Constructors, Inc., 112 N. Broad St., Philadelphia, Pa.



Building 6" Line—Florida

Philadelphia Gas Works Co. Launches Water Heater Drive

ONE thousand automatic gas water heater sales in two months.

This is the goal set by The Philadelphia Gas Works Company, Phila., Pa., in the Prosperity Plan, which was set in motion on September 12, and which will be brought to a close on November 12.

A booklet, fully describing the plan, has been sent to every employee of the Company.

H. S. Christman is general director of the campaign and R. A. Malony is assistant director. The Company is divided into 10 units, each having its own unit directors.

During the campaign an employee will receive $3 for a prospect for an automatic gas water heater sold within 60 days. Prospect books have been sent to employees. No one outside of the New Business Department is expected to do any selling. The bonuses and prize awards will be paid merely for turning in names of persons who purchase the appliance within the 60-days' limit.

A first prize of $50, a second prize of $30 and a third prize of $20 will be awarded to the three individuals having the highest percentages of individual quota.

There will be five individuals in each unit, exclusive of team captains who will receive cash prizes.

The captains, as individuals, are also eligible for these prizes. These prizes will be distributed to the five persons having the highest percentages of unit individual quotas. It is possible for an individual employee to win $80 in cash prizes in this campaign.

A grandfather's clock will go to the unit director making the greatest percentage of unit quota.

In each unit there will be two captains' prizes, a prize of $18 being awarded to the captain having the highest percentage of team quota, and $12 to the captain having the second highest percentage of team quota.

Team members will have the privilege of inviting their prospects to evening demonstration meetings at our North Philadelphia office at 8 p. m. on September 27, October 6 and October 18. The subject for the first meeting will be Beauty Culture; for the second, Washing and Cleaning; and for the third, Fancy Cooking and Baking.

A victory dinner will be held after the close of the campaign with directors of units and members of the Success Club as guests. Each man who turns in four productive leads and each girl who turns in two productive leads during the campaign will be members of the Success Club.

General Electric Appoint Rudd Managing Engineer of Motor Department

F. J. Rudd has been appointed managing engineer of the motor department of the General Electric Company, it has been announced by N. J. Darling, manager of the River Works at Lynn, Mass. He succeeds L. E. Underwood, who has been made manager of the Pittsfield, Mass., works of the company.

New Data on Improved Types of Superior Meters and Diaphragms

Superior Service Cleaners with the new exclusive three-way valve are a new development of that company of interest to the industry.

Superior Service Pump

The solid copper construction is described as a very sturdy pump with none of the objectionable corrosive drawbacks of the old style pump.

The pump has a capacity of 3½ gals. of alcohol and is minutely described in Superior Meter Co. Bulletin No. 22.

Superior Diaphragms

In all meter construction there is nothing more worthy of careful supervision than diaphragms.

Diaphragm Specifications

New Zealand prime skins are used in Superior diaphragms. Careful selection of these skins, which are tanned and converted into leather under our personal supervision, insures a most suitable diaphragm leather. Superior diaphragms are cut and wound by hand and treated with a composition of oils suited for the particular requirements. All diaphragms are aged between four and six months before placed in the meter.

The new improved ring with rolled edge, and inside solder joint is an important feature.

Special valve design and construction eliminates "noisy" condition. Specifications and details of construction outlined in Superior Meter Bulletin No. 20.

Superior Repair Service

In addition to supplying new semi-chrome and bark-tanned diaphragms, the Superior Meter Company maintains a repair department to serve the gas company. A line of provers and wet test meters is also manufactured by that company.

Open Cut Through Meter

For handling the large capacities necessitated by House Heating and Industrial loads a full line of Expansion Diaphragm Meters have been developed, embodying the best features of the "A" & "B" Meter but obtaining greatly increased capacities with the least possible space requirements.

For large capacities

Complete information on these and other Superior products will be gladly furnished upon request to Superior Meter Company, 167 41st Street, Brooklyn, N. Y.

New I-R Rock Drill Catalogue

"Rock Drills and Sharpeners" is the title of a 32-page illustrated condensed catalogue which consolidates in one volume information concerning Ingersoll-Rand equipment for drilling rock and for reconditioning drill steels. In addition to describing the various rock drills, including "Calyx" core drills, the booklet covers all accessory equipment and also contains instructions for correctly heat treating drill steels. Copies of the catalogue, Form 4101, may be obtained from the general offices of Ingersoll-Rand Company, 11 Broadway, New York, or from any of the company's branch offices.

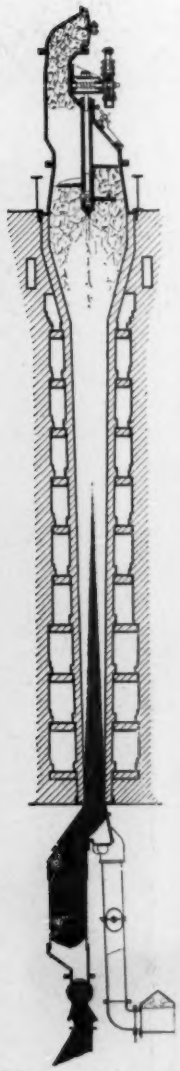
SUPERIOR

Gas Meters

Wet Test Meters
Demonstration Meters
Service Cleaners
Provers
Diaphragms
Semi-Chrome Bark-Tanned
Repairs

SUPERIOR METER COMPANY
BROOKLYN
New York

Glover-West Describes Vertical Retort Development



Diagrammatic section of retort showing coal feed, coke extraction and heating flues.

The first commercial installation of Glover-West Vertical Retorts was put into operation in 1908. This plant was connected with an independent auxiliary plant so that accurate tests could be made of the behaviour of coal in continuous vertical retorts and the results obtained under practical working conditions. Practically all the typical varieties of gas coal from all parts of the world were carbonized in this plant. The published results of these tests form the first collection of data on the subject of continuous carbonization of coal on a practical scale.

The second installation, built in 1910, also was tested on different classes of coals and the results made available to the industry.

Between 1911 and 1914 a total of 67 installations, comprising 2782 retorts, had been put into operation and the design had almost become standard. It was at this time that the practice of "steaming" was more generally adopted. The Glover-West system of zoning the carbonizing heats lent itself admirably to this development.

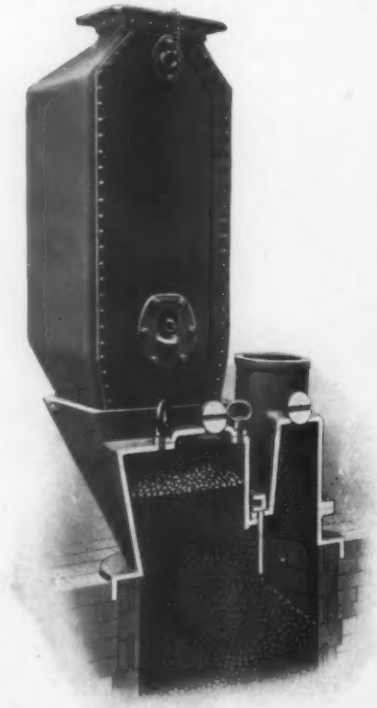
After the Great War further developments were made. Larger capacity retorts were built to further reduce the labor charges, waste-heat boilers were installed to take advantage of the surplus heat in the stack gases, improvements in bench and producer design were made to further increase the overall efficiency of the plant.

Design of the Bench

The successful operation of Glover-West plants is largely due to the three principal points embodied in their design:—

(1) The possibility of varying the temperature of the retort at any point in its length and to any required degree to suit the physical characteristics of the material being carbonized.

(2) The realization of the economy from the conservation and utilization of the available heat so that the losses are reduced to the minimum.



Phantom view of fittings at top of retort

(3) The maximum production of gas of any required quality with the maximum of secondary products.

In the bench, the combustion flues are arranged in parallel horizontal floors, each with its own dampers. Each damper can be separately regulated so that the temperature of the entire retort length can be equalized or varied to suit working conditions. At all times the setting is controlled entirely from one point, the stack damper.

Above the combustion flues the gases circulate around the top sections of the retort and heat the incoming coal. The gases then pass through a firetube boiler where their surplus heat is utilized for steam raising. The temperature of the gases leaving the boiler is usually only about 50° F. above the steam temperature. Thus, after heating the retorts 4½ pounds of steam at about 200 pounds per square inch pressure are obtained for every pound of fuel burned in the producer.

The secondary air used in heating the bench is pre-heated by passing around the base of the retort where it absorbs heat from the incandescent coke within the retort.

This heat given up to the secondary air, plus the heat used in the water gas reaction, ensures that cool coke is discharged so that water quenching, with its attendant expense and nuisance, is unnecessary.

Steaming

Due to the unique design of the bench, water gas can be made continuously in the bottom portion of the retort at the same time that coal gas is being evolved in the upper portion of the retort.

Thus it is possible in the Glover-West System continuously to produce water gas without any additional apparatus, without additional outlay of capital and without any additional labor.

Operating Results

There is a large amount of data on the operating results obtained in Glover-West Retorts available to the Industry. Much of this work has been carried out by such authoritative bodies as the American Gas Association, The British Institution of Gas Engineers, and The British Fuel Research Board. Below are given the results obtained by the Carbonization Committee of the American Gas Association at the Glover-West plant at Stamford, Conn. and published in the Proceedings for 1927.

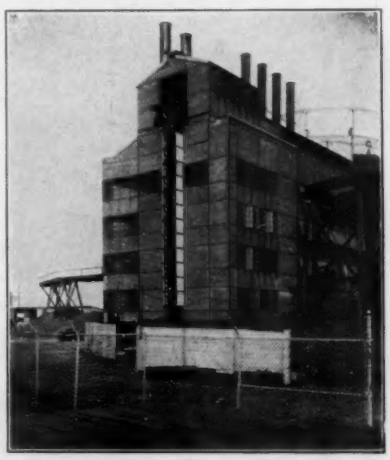
Operating Results
Pittsburgh Coal

Gas:	Yield per lb. coal	7.15 cu. ft.
	Calorific value	530 B.T.U.
Coke:	Make per ton coal	1399 lbs.
Tar:	Make per ton coal	14.55 galls.
Fuel:	Per ton coal	275 lbs.
Waste Heat Steam:	Per lb. produced fuel from and at 212° F.	575 lbs.

Recent Developments

The new Westvertical process has been developed to produce a coke which is dense, strong, and free from breeze.

This new process retains the heating system of Glover-West Continuous Vertical Retorts and most of the advantages of continuous carbonization and also produces a typical intermittent-operation coke both as regards density and strength.



Glover-West installation at Portland, Me.

As with the continuous system the coke from the new process is discharged cool and dry. The facilities for continuous steaming result in a more constant yield per hour from the retort than is usually obtained in intermittent carbonization.

Further data can be obtained from West Gas Improvement Co., 441 Lexington Avenue, New York, N. Y.

GLOVER-WEST VERTICAL RETORTS

Future Capacity

NOW is the time to think of future capacity. You will never find a better time than the present to look into your capacity requirements for the next ten and twenty years.

Glover-West Vertical Retorts simplify the problem of future capacities because such small ground area is needed for the first installation and extensions can be made easily and with the minimum expenditure.

In addition, the high thermal efficiency, low operating costs, extreme flexibility to meet changes in working conditions, kind of coal and demand for varying qualities of gas and varying loads make the adoption of Glover-West Vertical Retorts well worthy of consideration in any scheme of planning for the future.

During the Convention our representatives will be located at the Hotel Traymore.

West Gas Improvement Company

Builders of Coal Gas Plants

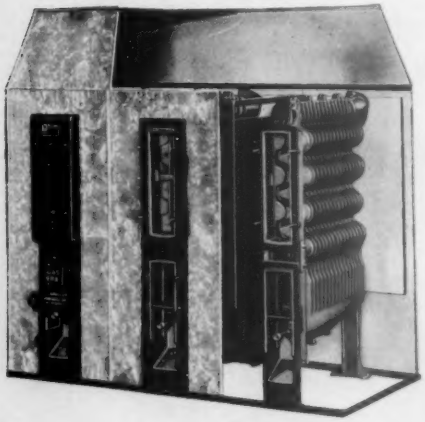
441 Lexington Avenue New York, N. Y.

Modern Appliances for Water Heating, House Heating and Air Conditioning

Mueller Gas Era Steam or Hot Water Boiler

Adaptable for steam or hot water heat, also for direct or indirect water heating. All interior surfaces are vertical and smooth, readily accessible for cleaning. Condensation within the boiler is entirely eliminated.

Steam boilers have A.G.A. ratings from 420 to 12,600 sq. ft. Hot water boilers from 670 to 20,100 sq. ft. Sectional construction permits assembly of required number of sections to handle the job.

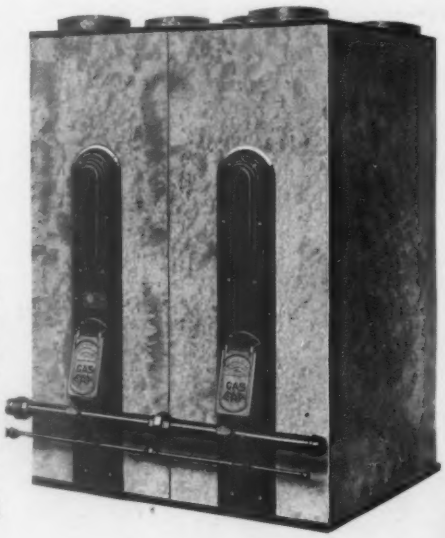


Mueller Gas Era Cast Iron Furnace

This furnace is of standardized unit construction. Sections are cast iron, formed of two half-sections, accurately surface ground and drawn iron-to-iron. Heat delivery is quick, uniform and positive. Exterior surface of the sections is heavily ribbed affording twice the surface presented by a smooth casting of similar design and materially increasing the strength.

Heat travel is amply baffled to secure maximum heat transfer. Interior of sections accessible for cleaning. All controls for completely automatic operation are provided. Adaptable for gravity or forced air heating.

Sections have A.G.A. input rating of 65,000 B.T.U. per hour, and net load of 47,500 B.T.U. per hour.



Mueller Gas Era Pressed Steel Furnace

In this furnace the sections are constructed of two half-sections of heavy, copper-bearing steel, formed under 500 tons pressure and seam welded into a one-piece unit.

Sections are corrugated and ribbed, with baffled heat travel, securing maximum heat absorption and transmission to the air in the casing. Interior accessible for cleaning.

Multiple unit construction, with sections and casing sections interchangeable.

Sections have A.G.A. input rating of 45,000 B.T.U. per hour, and net connected load of 33,000 B.T.U. per hour. May be used as gravity or forced air system.

Mueller Climator II Air Conditioning System

Climator II fans, washers and filters are individual units which when connected with any type warm air furnace provides complete air conditioning facilites. When used with Mueller Gas Era furnaces, operation of the complete system is automatically controlled.

Heats, washes, cleanses, humidifies and circulates the air uniformly. Cooling and dehumidifying units may also be added. Removable covers on filter holder permit introduction of outside air for summer comfort. Filters are available in two types, viscous cell, and fibre airmat. Climator II units are made in four sizes to handle any domestic requirement.

Mueller Climator III Air Conditioning Unit

This unit consists of filter, fan and washer in a single, compact casing. May be connected to Mueller Gas Era or any other make of warm air furnace. It will pass through an opening 27½" wide.

Removable covers provide access to filters and motor, and when removed, permit introduction of outside air for summer comfort. Filters are of replaceable, viscous cell type. An efficient, dependable air conditioning unit.

5 Reasons for Choosing *This* Gas Heating Line

1 Complete Line

Gas Era cast iron and pressed steel furnaces, and steam and hot water boilers, for natural, manufactured, and mixed gas. Climator Air Conditioning Systems, including blowers, filters, washers, and humidifiers. A complete line—from one, dependable house—to meet every demand.

2 Advanced Design

Gas Era furnaces are modern, multiple unit designs. Installations are easily expanded to meet increased requirements—simply put in additional units. Steam and hot water boiler sections are interchangeable. Furnaces and boilers operate without condensation. Every unit of Gas Era Equipment is substantial, simple, and efficient.

3 Lower Handling Cost

All parts, units, and packaging are standardized — to simplify your stocking and assembly, reduce inventory, cut handling costs, and speed up turnover. You can assemble any size furnace from stock, thanks to Mueller standardization and multiple unit design.

4 Engineering Service

Put your engineering problems up to our Engineering Staff. Mueller road men, branch offices, and home office engineers are ready and willing at all times to back you with real, practical service in preparing detailed estimates and installation layouts.

Let us figure with you for 1933—we can help you make it Revival Year!

5 Rock Bottom Prices

Mueller prices today represent the greatest values in the 75 years of Mueller history. There has been constant improvement of products, without increase of price. There is no "price handicap" to overcome when you quote on Mueller installations!

L. J. Mueller Furnace Co.
Milwaukee Wisconsin

GAS ERA FURNACES AND BOILERS

MUELLER

CLIMATOR AIR CONDITIONING SYSTEMS

THE COMPLETE LINE

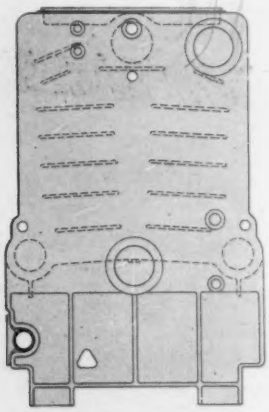
New Gas Boiler Has Interesting Features

The new gas boiler recently developed by National Gas Heating, Division of the National Radiator Corporation, Johnstown, Pa., has a cover worked out in French Grey Baked Enamel; dome, base, door handles and gauge panel are chromium plate. The cover design was handled by Walter Dorwin Teague.

The design of the boiler proper incorporates several features of interest.

End Section

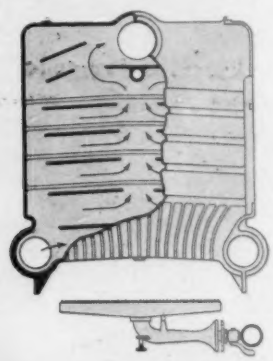
The rugged, extended-leg construction used on all right and left end sections, supports the entire boiler structure, eliminates base parts, makes it easy to level for the proper alignment of mains, and accommodates the enclosed manifold construction. All end sections are fully



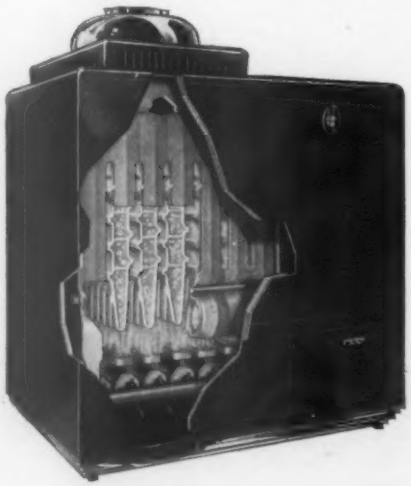
baffled, and transfer heat just as effectively as the intermediate sections. Flow tappings at rear of sections facilitate better piping arrangement. Return tappings at center of sections balance the flow through the lower nipples. Skimmer tapping is furnished to facilitate "washing out" steam heating systems.

Intermediate Section

Scientifically constructed interior baffles establish a series of tubes, assuring balanced circulation throughout every boiler section, and promoting maximum



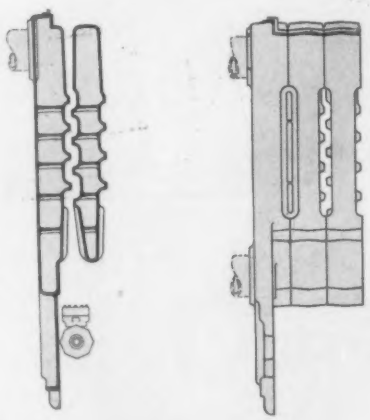
heat transfer and efficiency. Ample room is provided between the upper baffles and the water line. This insures rapid steaming and a steady water line in the steam boiler, and unrestricted water circulation with consequent heating effectiveness in the water boiler. The lower vertical, radial ribs, and the upper horizontal, extended flues offer an abund-



ance of prime heat absorbing surface. The hot gases, as they pass through the boiler, are continuously yielding up their heat.

Tapered Flues

Flue passages are scientifically proportioned and tapered. Flue areas are greatest where gases are hottest and flue areas are smaller where gases are cooler, thus maintaining uniform velocities through-



out their travel. The lack of pockets or dead air spaces is noteworthy. The internal tubes—formed by the baffles—pitch upward with the flow of water within them, thus accelerating the internal circulation.

Cleaning

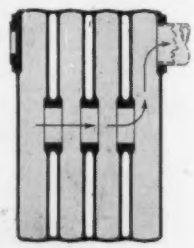
Quick access to the cleanable flue surfaces of the boiler is provided by convenient clean-out panels fitted with bayonet locks. The illustration shows one panel in place, and an adjacent one removed, exposing the flue surfaces for quick and easy cleaning.

Top View—Dry Steam

Steam-liberating space is large and unobstructed, and is of equal area, in end and intermediate sections. Circulation is uniform and quick-accelerating. These details unite to assure delivery of dry steam.

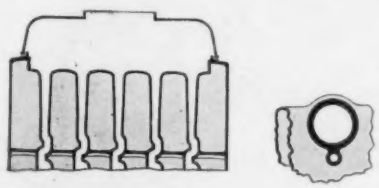
Flue Top for Efficient Heating

The National cast iron flue top, combined with National sections, offers an improved type of flue top joint. The boiler putty, used as a groove filler, is prevented from dropping into the upper flue openings and thus stopping the flow of gas. The flue top fits on the outer edges of the putty groove, making this protection positive and sure.



Nipple and Pull Rod Opening

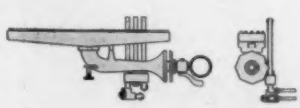
Nipple openings and pull rod passages in the boiler are entirely encased, by the use of ground iron-to-iron joints. Heavy



cast iron push nipples, machines to very close tolerances, afford durable watertight connections between the boiler sections.

Burners

A highly efficient, sharp-cone flame, is made possible by the many raised ports evenly distributed in the top of each



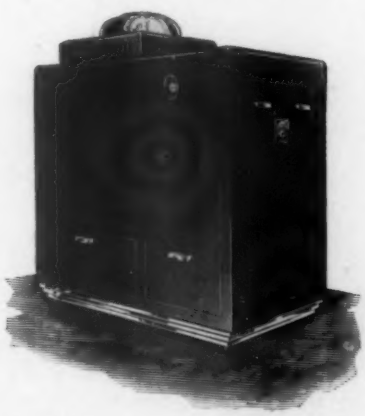
burner. No baffles are used. These burners perform in a quiet manner with natural or manufactured gas, both while burning and turning on and off. The mixing tubes, connecting the burner cock to the burner, are designed for unrestricted flow. Mixing shield with lock nut facilitates individual air-injection adjustment. Burner cocks have extended levers and provide steady flow and minimum friction.

EVERY GAS HEATING PROSPECT WANTS A BASEMENT ROOM...

THE final touch of smartness is added to the finer homes of today by a cheery, attractive, practical basement room. The desire for such a room is an additional urge to prospects to install gas heating. The possession of such a room is within reach of everyone, when a National Gas Boiler is installed.

The National Gas Boiler was designed with the requirements of a basement room in mind. Controls and chassis are completely insulated and encased in a cover of exceptional beauty, which was designed by Walter Dorwin Teague, an industrial designer of international repute. Mr. Teague designed the Marmon 16, the Eastman Kodak Line and many other famous products. Emphasis has been placed on utility and durability, as well as upon appearance.

The New National Gas Boiler Makes Such Rooms Possible . .



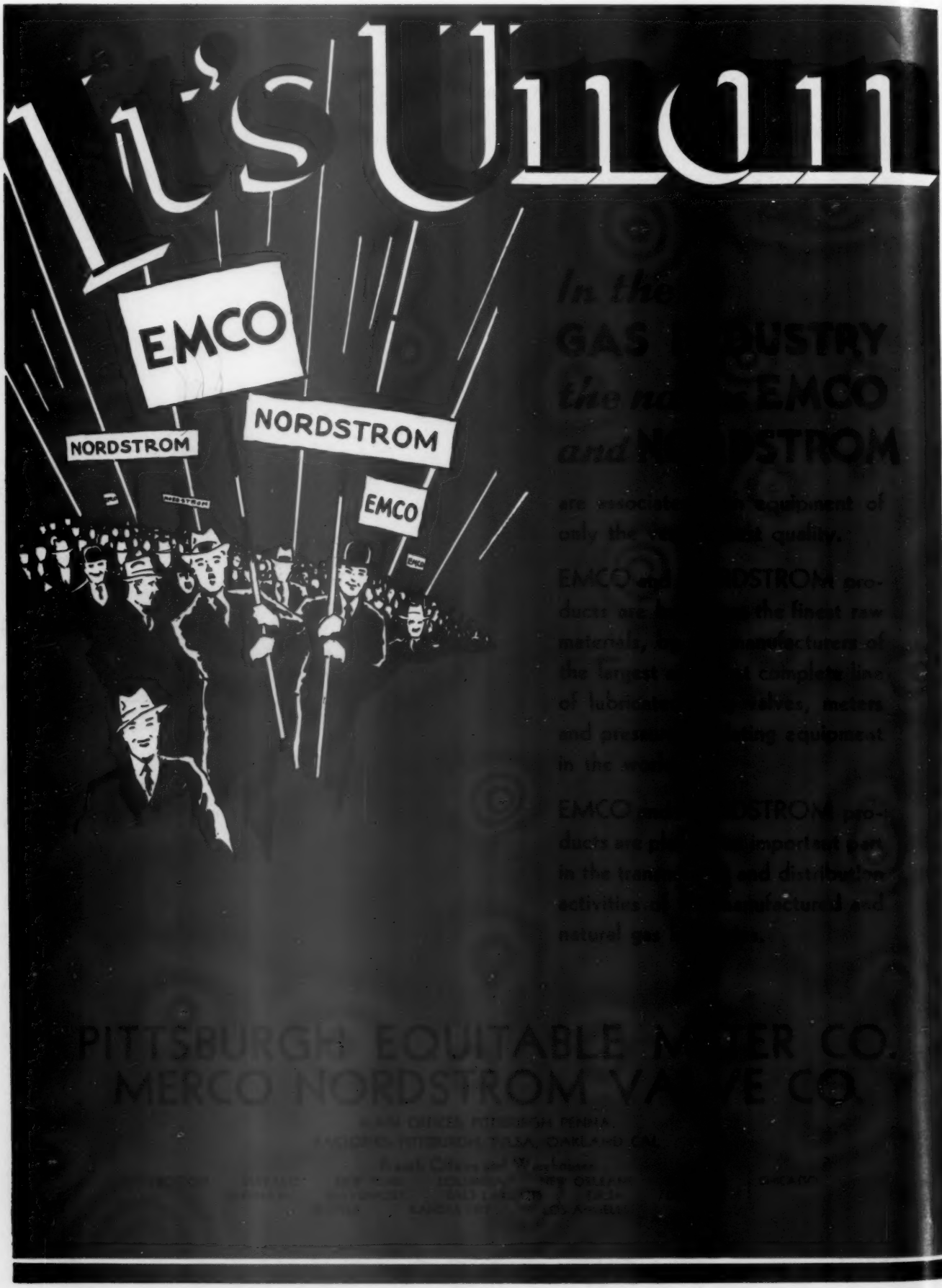
The body of the boiler is finished in French grey enamel. Base, dome, and trim are chromium plated. The assembly is a harmonious whole, simple, modern and in flawless taste.

With a unit so attractive, all need of partitioning the boiler (with consequent expense and loss of space) is eliminated. The boiler is part of the picture, contributes to the appeal of the room, just as it contributes—through its dependable and efficient operation—to the comfort of the owner.

The new National Gas Boiler has received A.G.A. approval and is now being manufactured, and installed in certain localities. As quickly as competent representation is secured, distribution will be widened. "The Handbook for Automatic Heating of Buildings" will be sent to anyone interested; just write.

NATIONAL GAS HEATING
Division of National Radiator Corporation

Johnstown Pennsylvania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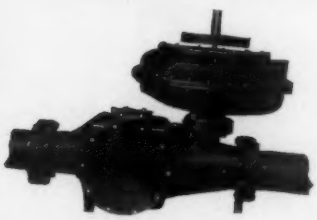
The EMCO NORDSTROM Ticket

for accurate measurement and positive control

EMCO METERS

Made in a complete range of sizes, for every kind of service. No single type of meter is suited to all requirements. For this reason Pittsburgh Equitable builds a complete line of domestic and large capacity meters. Among them you will be sure to find an accurate meter that suits your requirements.

X



EMCO REGULATORS

"Super-sensitive", the tribute paid by gas engineers everywhere to EMCO Regulators. Available in the proper size and type for every application where gas pressures must be controlled.

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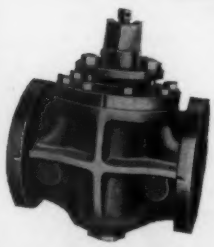

NORDSTROM VALVES

"The perfect application of a principle." The Nordstrom method of "Sealdport" lubrication has made practical the use of plug cock valves as large as 30" in size. The most satisfactory service is assured through their leak resistant, non-sticking and positive shut off construction.

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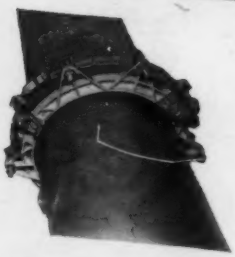


EMCO BELL JOINT CLAMPS

This clamp is designed specifically for one purpose—to stop leakage at the joints in existing cast iron bell and spigot pipe. The EMCO clamp is sectional in construction and may be applied to the joints without disturbing the line.

X

Pittsburgh Equitable Meter Co. Issues Data On Improved Lines

Emco Standard Domestic Meters

This meter is made with a grey iron outer case, in two types: one with both connections at the top, and the other with

EMCO Domestic Meter Top Inlet and Top Outlet

the inlet at the bottom and the outlet on the top. They can be furnished in a variety of sizes with connections ranging from ¾" to 1½" for capacities of from 400 to 890 cu. ft. per hour, at standard rating.

The Ironclad Meter

Ironclad

The Ironclad meter is adaptable for measuring both artificial and natural gas. Its heavy cast iron outer case permits installation in exposed locations. Available in four sizes for measuring volumes of from 300 to 1500 cu. ft. at standard rating.

Emco Curb Box Meters

The EMCO Curb Box Meter is arranged with connections so that it can be set inside of a concrete curb box with a suitable

EMCO Curb Box Meter

iron cover. Meter has a cast iron outer case plated to withstand the extremes of weather. Made in two sizes with 1¼" and 1½" connections for volumes of 400 and 890 cu. ft per hour at standard rating.

Emco Tin Meter

The EMCO Tin Meter is made in the 5 and 10 light types in both A and B sizes.

EMCO Tin Meter

Connections of ½", ¾" or 1" size are available.

Emco Large Capacity High Pressure Meters

These meters are made in various sizes with capacities ranging from 1800 to 5000 cu. ft. per hour. They are furnished with cast iron outer cases for 75, 100, 200 and 500 lbs. working pressure. The standard

EMCO Large Capacity Meter

index and index plate may be removed and replaced with an index plate on which is mounted either an Emcorector, a Wylie Pressure and Volume Gauge, an EMCO Combined Record Gauge or the EMCO Demand Meter Attachment.

The Emcorector

The Emcorector is designed and built to make high pressure positive meters direct reading. It replaces the conventional pressure and volume gauge as generally used on high pressure meters. It gives a direct reading of volume corrected to any base pressure, regardless of line pressure fluctuations. This eliminates the time and expense involved in making chart calculations. The correction is made automatically on small increments. The

Emcorector can be furnished for use on any high pressure gas meter.

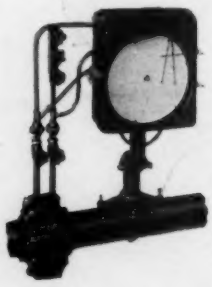
Emco Large Capacity Pressed Steel Meters

EMCO Large Capacity No. 5

EMCO Pressed Steel Meters are available in two sizes for measuring maximum volumes of 6000 and 10,000 cu. ft. per hour respectively, with a pressure drop of less than 2" of water. Welded Pressed Steel Construction permits a meter of large capacity which occupies a minimum of space. Types for both manufactured and natural gas.

Emco Orifice Meter

The EMCO Orifice Meter is designed to measure, through use of the orifice principle of differential pressures, ex-



tremely large volumes of gas. It can be furnished for all size lines with either 24 hour or 7 day charts, in differential ranges of 5", 10", 20", 50" and 100" and for static pressures of from 0 to 1000 lbs.

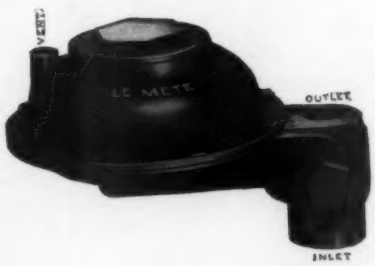
Emco Pilot Light and Gas Refrigerator Regulator

This is a small compact unit designed to control the burner pressure on gas-fired refrigerators and small gas-burning appliances. Can be supplied with ¼", ½", or ¼" connections.

Emco Gas Appliance Regulators

This regulator is made in a complete range of sizes from ½" to 3". It is designed to control the burner pressure on gas-fired appliances such as house heating boilers and furnaces, unit heaters, water heaters, incinerators, etc. Can be furnished in either spring or weight adjusted types.

Emco Service Regulator



Designed for domestic service to operate under high or low pressure, with artificial or natural gas. Has removable valve seat and disc. Regulators can be furnished with Dead Weight Safety Valves or Mercury Seals. Made in sizes ¼", 1", 1¼", 1½" and 2".

The Crawford Sensitive Regulator

The Crawford Regulator is designed primarily to reduce pressures on the inlet side up to five pounds, to outlet pressures ranging from a vacuum to six ounces outlet pressure. It can be provided for straight pressure control, back pressure control, or vacuum pressure control and can be loaded by means of either a spring or a weight. Applications of the Crawford Regulator have been made to gas engines, linotype machines, incandescent lighting, industrial installations and domestic services.

Emco High Pressure Balanced Valve Regulators

EMCO High Pressure Balanced Valve Regulators are manufactured in standard and special types, the standard being furnished in sizes from 2" to 24" for reducing line pressures of 600 lbs. or less per sq. inch to any delivery pressure from 5 lbs. to 300 lbs. The special type is made in sizes from 2" to 10" for reducing line pressure of 1500 lbs. or less per sq. inch to any delivery pressure from 25 lbs. to 500 lbs.

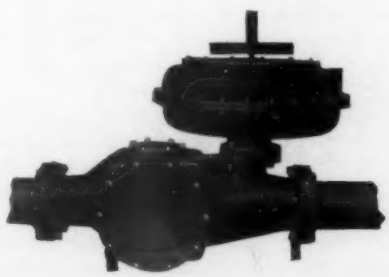
EMCO High Pressure Balanced Valve Regulators in sizes 2" to 12" inclusive, may be readily adapted for back pressure service.

The valve box on these regulators is also removable and interchangeable, which makes it possible to remove and replace the valve mechanism.

These high pressure regulators can also be furnished with metal diaphragms, mercury sealed, constructed especially for service in gas containing acid or other impurities.

Emco Low Pressure Balanced Valve Regulators

EMCO Low Pressure Balanced Valve Regulators are designed for the regulation of pressure on either manufactured or natural gas lines and are produced in sizes from 2" to 24".

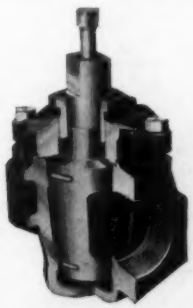


Emco-McGaughy Integrator

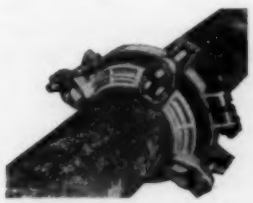
The EMCO-McGAUGHY Integrator is a development in office equipment designed to facilitate the calculation of the total extension of orifice meter charts. It is made in three types for calculating different makes of orifice meter charts. It is possible to calculate EMCO Orifice Meter charts with any type Integrator.

Nordstrom Lubricated Plug Valves

Nordstrom Lubricated Plug Valves, manufactured by the Merco-Nordstrom Valve Company, a subsidiary of the Pittsburgh Equitable Meter Company of Pittsburgh, Pa., can be furnished in a complete range of sizes for every type of installation. The "Sealdport" method of plug valve lubrication permits the use of plug valves as large as 30" in size. These valves can be made from a variety of alloys and for pressures of as high as 3,000 lbs. per sq. inch.



Emco Bell Joint Clamps



This clamp is designed for one purpose —to stop leakage at the joints in existing cast iron bell and spigot pipe. Sectional construction permits application to the joints without disturbing the line.

Lux Material Used By Gas Industry For 50 Years

Lux Material has been in the service of the gas industry for fifty years and, the manufacturers declare, is still unexcelled as a purifying material. The Alpha-Lux Company, since its inception has continuously striven to provide first, last, and at all times, a quality product. The company points out that if the costs in gas plants are scrutinized a small item for H_2S removal will be found. Notwithstanding its smallness on the cost sheet compared with expenses in other branches of operation, this small purification item, like the proverbial snowball, can grow to become a worrisome and expensive job if not properly handled. That is why, the makers point out, Lux Material should be specified.

Handles Rates of Flow

Some gas plant men use Lux at all times because of the length of time it has been found to remain in the boxes. Other gas company engineers and superintendents have shown a preference for it, according to the Alpha-Lux Company, because it could handle rates of flow far above those previously considered possible. It efficiently purifies at temperatures considerably below normal.

Prof. Huff's Opinion

According to Professor Huff, professor of gas engineering at Johns Hopkins University, Baltimore, Md., iron oxide, ferric oxide or FE_2O_3 are worthless for the removal of hydrogen sulphide (H_2S). This statement was made by Professor Huff in a paper read at the Southern Gas Association Convention three years ago. He said that in common with ordinary gas engineering the term "iron oxide" has been used, but the active material in the purification box is not "iron oxide" but "ferric hydroxide" or "ferric hydrate." In other words, he pointed out that ferric oxide with chemically combined water or moisture is a compound of very different properties than chemically pure iron oxide which latter is useless in gas purification. Professor Huff further holds that water or moisture is necessary both in the chemical combination with the iron oxide to give ferric hydroxide and also in the form of film to permit the chemical reaction to proceed in the water solution. The effect of moisture is very striking and particularly so in the revivification of the iron sulphide to form again the ferric hydrate. Some experiments have been made to ascertain the proper humidity necessary for complete revivification of the ferric hydroxide and they show that a sample exposed to air at 95% humidity completely revivified in five minutes whereas the sample exposed to a humidity of 10% did not revivify until an hour and a half elapsed.

Lux is a Ferric Hydroxide

Lux is a ferric hydroxide and always runs uniform in its constituents, the manufacturers declare. Lux contains on a dry basis about 50% to 59% ferric hydrate. Furthermore, it is in a collodial state, contains no free iron and may be stored indefinitely without heating up. Lux acts with full vigor, the company states, as soon as it is put in the boxes. It works equally well in the first application. It can be traversed by the gas at a higher velocity (an advantage, the Company, points out, in plants working at times beyond the capacity of their purifiers). Lux has a lower specific weight than other materials, the weight per bushel is less. This advantage lies in less material by weight to be required to fill the purifying boxes and a much larger purifying surface, according to the Company, which adds that this is an important point in figuring the cost of sponge. Lux contains no dead weight like earth or fibre. The material is designed to purify in every particle. It is also stated that Lux requires fewer changes and will revivify quicker. Lux is shipped to all civilized countries. Further details on request to The Alpha-Lux Company, Inc., 192 Front Street, New York, N. Y.

Hand Calorimeter

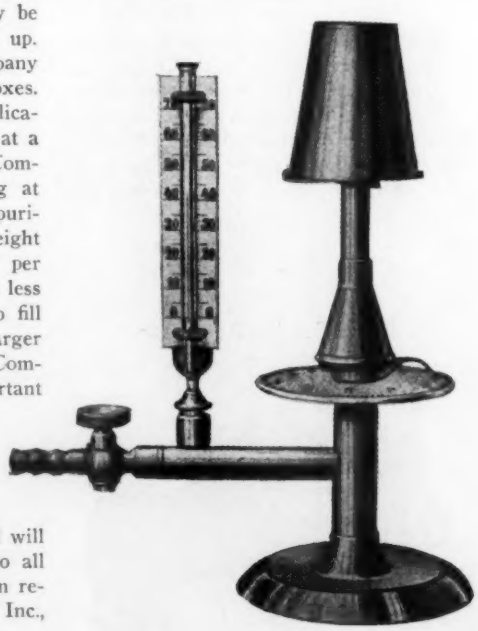
The Dr. Strache-Kling (Loeffler Model) Hand Calorimeter is marketed by the Alpha-Lux Company, Inc., for determining the heating value of gases. It is portable, weighs under 10 pounds and requires a small quantity of gas for each determination. No water connection is required and a determination can be made in one minute. No special training is required for operation. This calorimeter does not require standardizing by H_2+O gas. The principle involved is the burning of an air gas mixture, of a known quantity of gas with a definite volume of air, in an explosion pipette insulated by means of a Dewar Vacuum Jacket. The temperature rise is recorded on an inserted thermometer. Each instrument is equipped with a computer table.

Dr. Ott-Lux Gas Tester

The Dr. Ott-Lux-Gas-Tester is simply constructed and easy to operate. It combines in one operation the information usually obtained by three manipulations: Gas analysis, specific gravity determination and calorimeter tests. While it is not designed to replace any of these three tests where specific results are required it will show any changes in gases which are caused by changes in composition, gravity or heating value.

Lux Recording Gauge

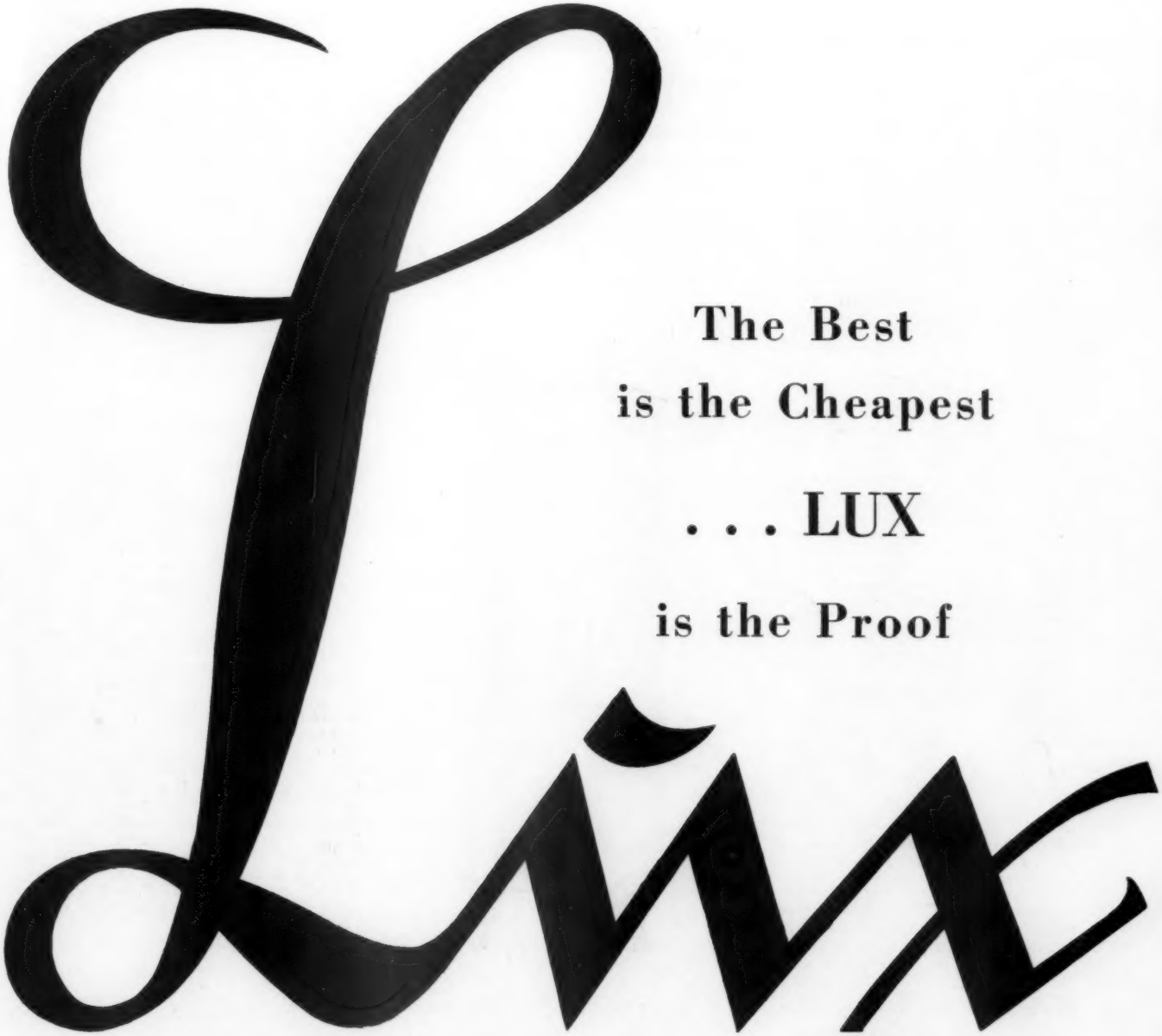
The Lux Recording Gauge (Simmance and Abady System) is for recording specific gravity of manufactured gas. It is designed as an essential to the smooth running of a gas plant, as the determination of pressures and heating values. In the Simmance-Abady System-Lux-Recording Gravity balance, the Alpha-Lux Company has an instrument designed to give at a glance any changes that have occurred at any time and, also, a permanent record of the specific gravity of gas 24 hours of the day. Further details on these instruments gladly furnished on request.



Booklet on Hard Rubber

New information on hard rubber in sheet, rod and tubing form has just been issued in a new booklet published by The B. F. Goodrich Rubber Company, Akron, Ohio.

Among subjects in the booklet are: "Properties of Goodrich and Defiance Hard Rubber Goods," "Resistance to Chemicals," "Machining Qualities," "Finish and Tolerances," "Possible Variations," "Suggestions for Machining," and "Weights." Copies may be obtained on request.



LUX is efficient at all times—in all seasons. It lasts three times longer than other purifying materials because of greater activity and efficient removal of H_2S

The use of LUX obviates many changes and, as a result, makes for smoother plant operation and lessened labor costs. It enables you to increase the velocity of gas *three times.*

Gas engineers have used more than 500,000 tons of LUX in ten years. Consequently, it is true economy to specify LUX—the best gas purifier and, therefore, the cheapest.

Two modern Lux-Sponge Plants (Philadelphia and Chicago) are in a position to render prompt service. Order your supply from the nearest plant.

The Alpha-Lux Company, Inc.

192 Front Street, New York

Philadelphia **Chicago**

THE BEST GAS PURIFIER

Trends in the Design of Automatic Water Heaters

By a Member Engineering Staff

Cleveland Heater Company

One has to be deprived of his gas water heater only for a day or two to realize how indispensable hot water is to modern life in America. The change that the gas water heater has brought into the life of every American is truly amazing. To millions of people the water heater means better living conditions. If it were not for the gas water heater you still would be heating water in a teakettle for your bath on Saturday afternoon.

The tank water heater was a decided improvement over the teakettle and the water-back. A small volume of water was heated at a time and delivered to the top of the storage tank, where it could be used immediately or stored for later use. However, the enormous demand for hot water and the demand for more convenience and comfort encouraged manufacturers to develop the Automatic Water Heater. And now we can have Automatic Hot Water Service for the smallest home or the largest hotel.

The First Automatic

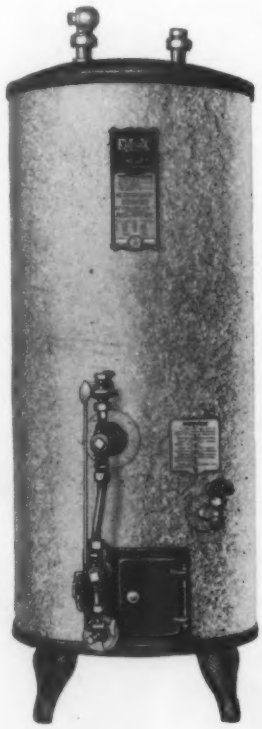
The first automatic water heaters were nothing more than the old non-automatic system equipped with a thermostat. A thermostat is essential, but there are other features about automatic water heaters.

Unity of design is desirable for tank water heaters, but essential for automatic water heaters. The mechanical brains, nerves, and muscles of a practical automatic water heater must be so designed and coordinated that no combination of manual control and supervision can approach its operating perfection.

Must Stand the Test of Continuous Use

Close coordination is not the only requisite of an automatic water heater. With the precision needed to reproduce automatic hot water service under all conditions, day or night, summer or winter, there also must be sturdiness of construction. Every time a manually operated water heater is lighted or turned off, the owner inspects it to a certain degree. The state or condition of his water heater is always known to him. But owing to the continuous action of an automatic water heater such inspections rarely or never happen. Consequently, the parts that are subject to wear and exposed to heat, also the operating and safety controls, must be built with an extra factor of safety to resist operating stresses.

A manually controlled water heater may be compared to a service station; it is called upon to heat water only when the necessity arises. The automatic water heater, on the other hand, is not a service station but a continuous source of hot water. It begins to operate when the water in the storage tank cools, and continues until the water has been heated to the desired temperature. To insure long periods of uninterrupted service, the coils of an automatic water heater are, therefore, made of a heavier gauge than those of the circulating water heater. Strengthening the coils in this manner is one of the features involved in the construction of an automatic water heater.



New Rex Automatic Water Heater

The Automatic Water Heater of the Future

The ultimate goal in the design of an automatic water heater is a tailor-made product; uniform and standardized, and adaptable to the modern home. The different elements involved in carrying out these plans include the proper design of burner, storage tank, thermostat, and safety controls. Moreover, the proper functioning of an automatic water heater depends not only upon the proper functioning of the separate or various parts, but also upon their grouping and the sequence of their action in harmony with each other.

The automatic water heater of the future will be flexible and controllable by the user as to quantitative output. No longer will it be necessary to heat large quantities of water for days some members of the family spend away from home. Then again the user can have twice or three times as much hot water if he so desires. This is a rather advantageous improvement as most folks when they form the hot water habit use more than theretofore.

No, this is not a dream. Such an adaptive water heater has been built in The Cleveland Heater Company's Laboratory, and it is a tailor-made product with sufficient flexibility to take care of abnormal and subnormal demand.

Rex Snap-Action Thermostat

The Rex Snap-Action Thermostat is an instrument by which the temperature of the water in the storage tank of a gas water heater is regulated. It accomplishes this by means of turning-on or turning-off the gas supply to the main burner as required. It operates on the natural laws of expansion and contraction. Operation is automatic and simple. The expanding element is a cylindrical bellows, filled with heat-sensitive gas and hermetically sealed. As the water becomes hot the bellows expands and pushes forward the finger mechanism, which slides over the roll of the gas valve, pulling the valve towards it and closing the valve. Closing of the valve is snap-action and the makers state this feature obviates back-flash of the gas flame into the mixer tube. The Rex Snap-Action Thermostat is of all-brass construction. Every working part is carefully machined. And every thermostat is tested before it leaves the factory. They are made for various uses and can be had with a temperature setting as low as 100° F. and as high as 300° F. and any temperature within this range. They can be used in connection with any liquid heating process when gas is used as the fuel for heating.

Rex Multi-Unit Storage System

The Rex Multi-Unit Automatic Storage System is designed to furnish hot water in large quantities for large residences, apartment houses, office buildings, hotels, restaurants, bakeries, factories, and other commercial and industrial establishments. It is compact in design, equipped with gas safety valve, also temperature and pressure relief valve. An insulated storage tank contains a supply of hot water at the desired temperature to meet anticipated demands. Copper coils are a feature. The coils are over-size—1¼ and 1⅛ inch diameter. The manifolds are two-inch pipe size. This construction is designed for free circulation and a large heating surface. Coils are removable for cleaning. The Rex Multi-Unit System can be built in any size; however, the manufacturers recommend five standard sizes to take care of most requirements. By using standard sizes the disadvantages of special construction and fittings are eliminated. Every Rex Multi-Unit System is assembled and tested at the factory before it is shipped. The unit is shipped knocked-down. For further information address the Cleveland Heater Co., Cleveland, O.

1... The New Rex Model "T" Water Heater is equipped with double control. A thermostat controls the temperature of the water. The new Rex Triple Burner controls the daily average quantity of hot water. Thus regulating both temperature and quantitative output.

YOUR CUSTOMER WILL APPRECIATE THESE THREE DISTINCTIVE FEATURES

2... Your customer can, if she wishes to, increase her daily average supply of hot water by the simple operation of opening a gas valve. Thus on laundry days, or when she entertains, she never needs to stint and worry about having sufficient hot water.

3...Your customer can, if she so desires, decrease her daily average supply of hot water and reduce gas consumption by changing the valve setting. She will appreciate this, as there are times when some members of the family are away for days.

REX MODEL "T" AUTOMATIC WATER HEATER

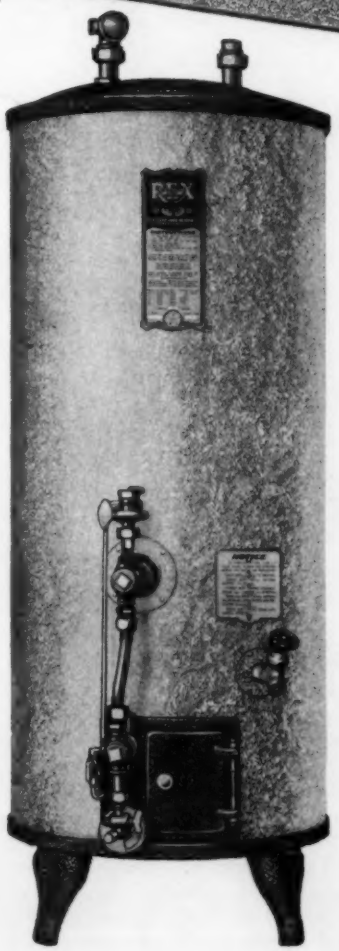
WHY YOU SHOULD SELL THE NEW REX MODEL "T" AUTOMATIC WATER HEATER

Because the new Rex Model "T" can more readily be adjusted to meet your customer's needs than any other water heater. No two persons, nor two homes will use the same quantity of hot water. You can with a Rex Model "T" installed assure your customer that this water heater is measured to his need, but sufficiently flexible to take care of any abnormal or subnormal demand. The Rex Model "T" is truly a tailor-made product.

Because you can now offer Automatic Hot Water Service to thousands of prospects, who for years have wished to own an automatic water heater but hesitated to buy because of the uncertainty of the gas bill or because the water heater would furnish them with more hot water than they can conveniently use. For these prospects you will have a water heater to fit their needs and you can assure them accurately what the monthly gas bill will be.

Because you are not limiting your customers' hot water needs. You are giving your customer the free opportunity to purchase more or less hot water.

We want you to be convinced of these facts. May we suggest to you to order a 17 or 24 gallon Rex Model "T" for test and inspection.



ADAPTABLE . . . TAILOR-MADE

THE CLEVELAND HEATER CO
1900 W. 112th St. Cleveland, Ohio

More Leisure Hours Theme of Estate Gas Range Promotion

"More Leisure Hours" is the slogan of Estate Stove Co., Hamilton, O., which they term the "three magic words" in Estate automatic gas range sales.

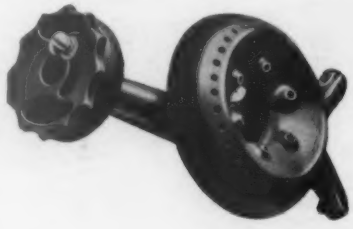
Showing Operation of Automatic Time Control

The illustration shows the model K-41 table-top range. It has silvery estalloy cooking top; fresh air oven—heavily insulated; Thermostat oven heat control; rigidraw smokeless broiler; two utensil drawers — one completely equipped with spice canisters and cutlery. It is finished in full porcelain enamel in green, ivory or pure white.

Automatic time control is an optional feature of Model K-41 and K-411. These table-top ranges are equipped with easy and economical automatic cookery.

All Estate gas ranges include the following features—uniform oven heat, a well insulated oven, accurate oven heat regulation, positive time control, a smokeless, adjustable, drawer-type broiler and toaster, roomy cooking top with cover plate, a ring-type cooking top burner with wide range of adjustment and safe, automatic burner lighting.

A special feature of Estate gas ranges is their new cooking-top burner. High efficiency is secured because the flame spreads over the entire bottom of cooking vessel. The flame can be adjusted to any degree of heat required, from a low simmer to a high giant burner capacity, by turning the gas valve handle. Thus a special giant burner and a simmering burner are made unnecessary. Safety is assured as proper spacing of the parts results in instant and complete ignition.



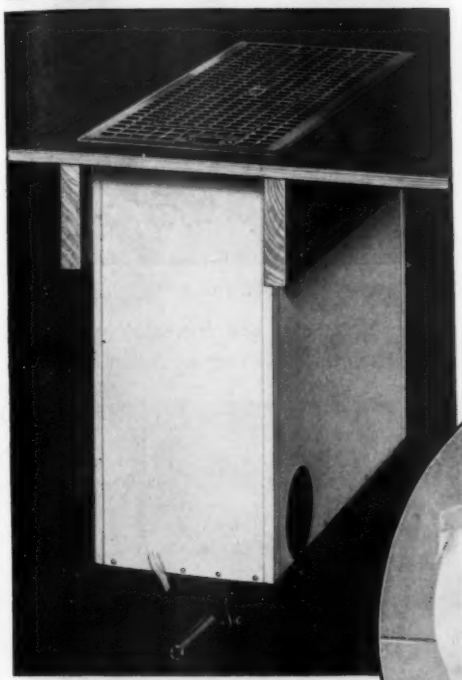
Estate Gas Heatrola

As a welcome alternative to the old-fashioned stove, the coal shovel, the bucket, the poker—The Estate Stove Company offers workless warmth with the Gas Hetrola. Equipped with ThermEstate Automatic Heat Control, Gas Heatrola puts an end to heating cares, circulates moist, breathable warmth through all the rooms of the small home, apartment, office or store, maintains an even temperature at all times. For manufactured or natural gas. Handsome grained-walnut cabinet. . . designed to bring new beauty to its surroundings . . . the Estate Gas Heatrola is available in three sizes, to meet every heating requirement.

Gas Heatrolas—Model No. 101

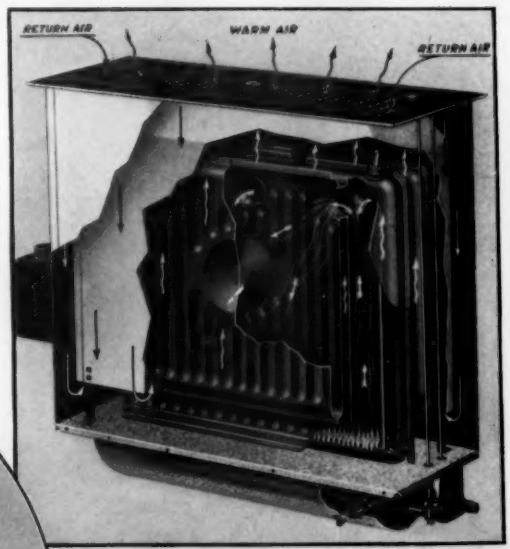
Gas Heatrola—Model No. 61

BIG NEWS!

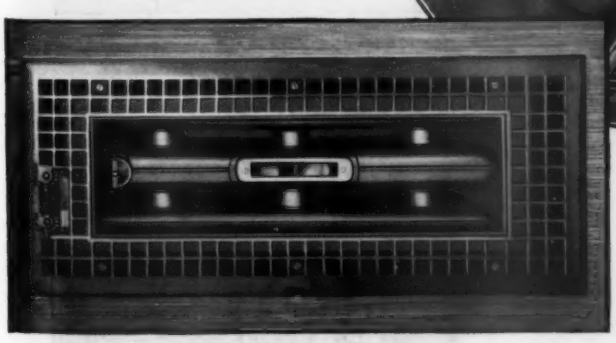


Installed under the floor, between joists, only the register face of the In-a-Floor Heatrola extends into the room. B. T. U. input per hour —45,000. Rated heating capacity — 3,500 to 5,000 cu. ft.

Completely enclosed combustion chamber—must be flue connected, hence no fumes, no "sweating". Note the long up-and-down travel of the products of combustion.



Absolutely new and unique operating feature. Pull up the pilot lighter until ports can be reached with a match, then lower it to normal position.



"Airplane" view of In-a-Floor Heatrola, with center section of register face removed. Note the big window through which burners are clearly visible.

With a thermostat and safety pilot (furnished at extra charge), the In-a-Floor Heatrola provides completely automatic heat. What a story to tell your consumers!

Estate—trail-blazer of the gas appliance industry (color ranges, March, 1928; gas circulating heaters, August, 1927; table-top ranges, October, 1930)—presents a new, improved gas-fired Floor Furnace—the In-a-Floor Heatrola. Shipments NOW! The Estate Stove Company, Hamilton, Ohio.

New Models In Magic Chef Gas Range Line

Magic Chef Line 29 is one of the latest developments in table top range design offered by the American Stove Company, Cleveland, O. This range has bakelite drop handles and is compact. A cooking top cover hides the cooking top and to afford additional space for storing utensils. When closed it gives the appearance of a console cabinet. The broiling compartment has a unique extension carriage, which when pulled out supports the pan in the open for the easy turning of meats. These stoves are entirely enameled. The finish on panels and top resembles Italian marble.

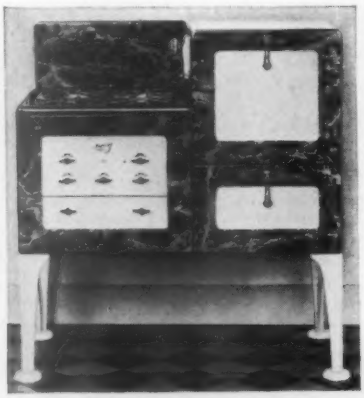
Magic Chef—Series 29

Dimensions: Baking oven 17" wide, 20¾" deep, 14" high. Broiling oven 17" wide, 20¾" deep, 9" high. Utensil drawer 21½" wide, 22" deep, 6" high. Range (extreme) 50" wide, 27¾" deep, 43½" high. Cooking top 25½" wide, 22¾" deep. Height of cooking top from floor 34".

Magic Chef Range Series 500

A compact gas range, 40¼" wide. It has ample cooking and baking capacity for a family of ten. The Series 500 has a folding cooking top cover that folds over the cooking top, hiding the grates from view. New style burner tray conceals the burners and pipes except the small burner heads. Easy to keep clean. Unique broiling pan requires no rack. Special design prevents fats from catching fire. Also, equipped with the famous Red Wheel Oven Heat Regulator that watches the baking while you are away.

Dimensions: Baking oven 16" wide, 18" deep, 14" high; Broiling oven 16" wide, 18" deep, 8" high; Utensil drawer 17¾" wide, 18½" deep, 5¼" high; Range (extreme) 40½" wide, 25¾" deep, 42¾" high. Cooking top 21½" high, 19½" deep; Height of cooking top from floor 33½".



Magic Chef—Series 500

Magic Chef Burner Features

Magic Chef 3-in-1 Non-Clog Top Burners are designed to give the services of three burners in one. By turning one valve a simmering, medium, or hot fast flame is obtained. Burner heads are of aluminum alloy. Burner is cleaned by unscrewing aluminum head. Gas openings being on the side, spillovers will not run in and clog them. It has been tested. When the valve is turned to full on the heat is as intense at its extreme edges as in the center.

Magic Chef Range Series 600

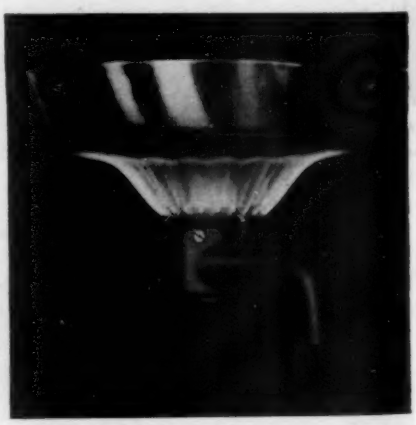
This series has right hand oven only. Porcelain enameled in old ivory finish with two tones of green and panels of cocoa-brown basket weave. A large, full sized range with ample cooking capacity for a large family or extensive entertaining. Standard equipment includes insulation, Red Wheel Lorain Oven Heat Regulator, Magic Chef Automatic Top Lighter, Three-In-One non-clog top burners and sanitary high burner tray. Handles onyx, green Bakelite.

Dimensions: Baking oven 17" wide, 20" deep, 14" high; Broiling oven 17" wide, 20" deep, 9" high; Utensil drawer 19½" wide, 22" deep, 16" high; Range (extreme) 47" wide, 28½" deep, 43" high; Cooking top 23" wide, 22½" deep; Height of cooking top from floor 34"; Clearance between top and cover when closed 8". Reversible broiler pan. Insulated oven. All bolts and bolt heads entirely concealed. Doors balanced by springs.

Simmering Flame

Gas cock handles are concealed when cover is down. Broiling extension carriage. When cooking top is closed this range gives the appearance of a console cabinet.

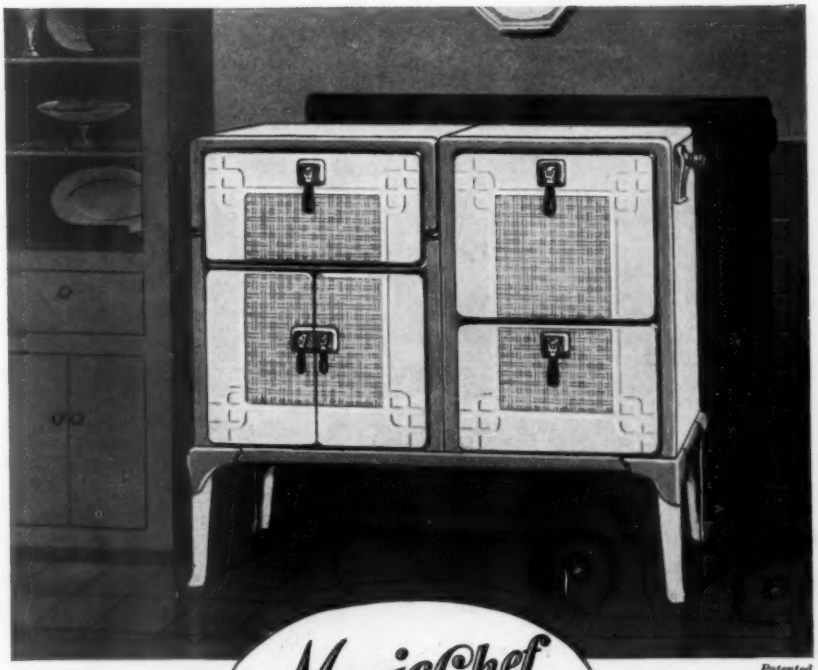
Medium Flame



Hot Fast Flame

More detailed data can be obtained by writing direct to the American Stove Co., Cleveland, O.

Look for the RED WHEEL
When you buy a MAGIC CHEF



Patented

Magic Chef
AMERICAN STOVE COMPANY

Look for This Trade Mark

Bank on Recognized Quality for Fall Business

At this time when the consumer is revolting against merchandise whose trashy quality is smoke-screened by low prices—

At this time when millions of women have reached the limit of their endurance in putting up with outmoded and outworn gas stoves—

At this time when these women are awake as never before to the advantages of a thoroughly modern gas range with its many advanced features of convenience and efficiency—

At this time when the frozen stream of buying power is being thawed loose—

Bank on the gas range of recognized quality and definitely established salability for stimulation of your Fall business.

Bank on MAGIC CHEF.

AMERICAN STOVE COMPANY

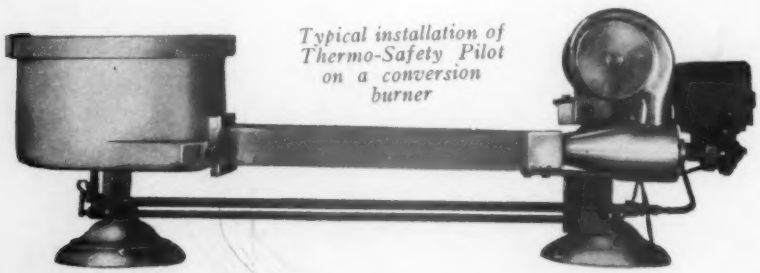
World's Largest Manufacturer of Gas Ranges

NEW YORK · PHILADELPHIA · ATLANTA · CLEVELAND · CHICAGO · ST. LOUIS · SAN FRANCISCO · LOS ANGELES

Modern Safety Equipment For Gas Appliances

Thermo Safety Pilot

The Thermo-Safety Pilot is designed for use on such gas fired appliances as furnaces, boilers, space heaters and conversion burners. Its makers, the Milwaukee Gas Specialty Co., have utilized the Bunsen flame principle in an entirely new manner . . .to insure reliability and safety of operation.



Typical installation of Thermo-Safety Pilot on a conversion burner

Venturi and air intake are correct in design, and properly proportioned to effect a Bunsen-like blue flame that is unvarying and of pronounced stability. It is enabled to withstand strong concussions because its design and construction effect balanced pressures in the combustion chamber. Both primary air intake and flame port (the point at which the flame burns) are equal and balanced at both points.

Thermo-Safety Pilot

The Thermo-Safety Pilot is made in three styles—(1) Thermo-Electric Safety Pilot, used in connection with an electric shut-off valve; (2) Thermo-Pressure Safety Pilot, used in connection with a pressure shut-off valve; (3) Plain Pilot, where there is more than one burner in the same chamber (one of which is controlled by a safety-pilot) the second and third burners are ignited by a plain pilot. Any of these three styles of pilot may be used with either manufactured or natural gas . . . or with butane air mixtures. For manufactured or natural gas pilots are interchangeable.

Thermo Safety Pilot for furnaces, boilers and all gas-fired appliances both domestic and industrial

No. 333 Non-Stick Gas Cock Grease

No. 333 Non-Stick Gas Cock Grease is a new and improved lubricant designed to prevent gas cocks from sticking as well as lacking at the high temperatures to which they are subjected, especially on the concealed manifold type of gas range.

Non-Stick Grease is equally effective on manufactured, natural and liquid petroleum (bottled) gases.

For Servicing, Non-Stick is sold in small, handy size cans in amounts sufficient to grease approximately 250 gas cocks.

Gas Cocks and Fittings

The Milwaukee Gas Specialty Co. builds gas cocks and fittings for every appliance need . . . including all standard types used on manufactured, natural, and liquid petroleum (bottled) gases. These gas cocks withstand the extremely high temperatures encountered in the latest types of concealed manifold ranges.

Gas cocks used for central house-heating appliances are rated on the basis of minutely accurate and complete tests which determine the pressure drop through the gas cocks under varying conditions of pressure, rate of flow and orifice size.

Complete data on all of these products will be sent upon request to Milwaukee Gas Specialty Co., Milwaukee, Wis.

No. 3200 A.G.A. Adjustable Tailless Cock

No. 6270 Union Cock ⅛" or ¼" Union . . . 9/16" . . . 27 Pipe thread

No. 360 Adjustable Elbow

No. 4990 Mixer Pin

Rutz Safety Push Button Lighter

The Rutz Safety Push Button Lighter has been developed for use on open manifold, semi-concealed manifold and concealed manifold gas ranges . . . not only on manufactured, natural and mixed gases, but on propane and butane gases as well

The lighter illustrated is a vertical valve type for use on concealed manifold and semi-concealed manifold gas ranges. It is made so as to permit certain necessary variations of parts and dimensions which tend to make it easily adaptable to individual gas range design.

The multi-flame pilot consumes less gas and is far more stable since its several flames are not easily extinguished—a feature that in itself is an extra guarantee of safety. Two conscious operations; first, turning on gas; second, pressing button, makes the Rutz foolproof.

More Readily SALEABLE

● National advertising . . . appearing regularly in *Good Housekeeping* and *Ladies Home Journal* . . . carries the story of *better results with Thermolator equipped ranges* to four and one-half million women — prospective customers of yours. ● Your leading trade papers, outside front covers and two-page spreads, carry the latest Thermolator developments — sales ammunition for your own use and for your salesmen and other sales outlets. ● This powerful advertising adds *saleability* to the many other Thermolator advantages.

MILWAUKEE GAS SPECIALTY CO
MILWAUKEE

● *It will pay you to get* ***all facts*** *about Thermolator . . .* ***write*** *for new book, "What Makes a Range 'Go'?"*

The advertisement at right appeared in Thermolator's 1932 campaign in "Ladies Home Journal" and in "Good Housekeeping."

The Secret of Perfect Baking

THERMOLATOR

★ THE DEPENDABLE OVEN HEAT CONTROL

protects all your baking from failure . . . *automatically* . . . whether you are a born cook or a beginner. All reliable published recipes now list time and temperature. Just depend on the *Thermolator* to keep the oven at exactly the required temperature. Its higher sensitivity guards against any variations . . . makes temperature accuracy as easy for you as measuring ingredients. Be sure that your new gas range has the *Thermolator*.

● "Oven Secrets," a new booklet with valuable pointers, is free. Write for it. No salesman will call.

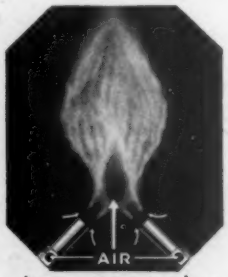
Milwaukee Gas Specialty Co.
Milwaukee, Wis.

Thermolator

THE *Perfected* BI-METALLIC OVEN HEAT CONTROL

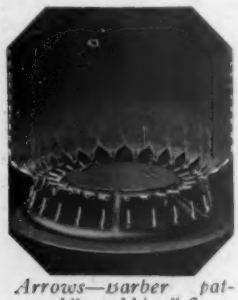
Combustion Principle of Barber B urner

The combustion principle of the Barber Jet Gas Burner provides for the introduction of auxiliary air above the gas orifice in the jet tubes. As the premixture leaves each pair of jets, a vacuum is created which draws into the flame the additional air required to develop perfect combustion upon increased gas pressure. The perfect combustion or burning of gas is dependent upon its union with a proper amount of oxygen as may be extracted from the air. Note how the BARBER PATENTED JET PRINCIPLE combustion is obtained, liberating all the heat contained in the gas.



Arrows indicate where necessary air is taken in to mix with gas to develop perfect combustion at varying gas pressures.

The Barber Jet Burner principle of combustion as illustrated above is recognized by heating authorities. It develops a flame temperature of 1,960 degrees Fahr., with 550 B.t.u. gas. It is not affected by dirt, corrosion or condensation and will not back-fire or deposit carbon, under any pressure. It requires no burner adjustment, regardless of gas pressure or quality of the gas.



Arrows—Barber patented "scrubbing" flame application to heater side walls—direct—no loss of heat.

The Barber Gas Burner produces an orange-green flame with manufactured, natural or mixed gas, and over a period of 14 years is said to have proved in practice as well as in engineering tests to develop from 10% to 20% greater efficiency than the average mixer-type gas burner.

Barber Jet Gas Burner

The Barber Patented Jet Gas Burner develops high efficiency in burning gas and then follows the second natural requirement for economical heating, which is—properly applying the heat. The accompanying illustration shows how the Barber Burner throws the flame *directly* to the place where it is needed and the heat hugs and scrubs the heating surfaces of furnace or boiler. Then flame produced by the Patented Barber principle can be applied *directly* to the heating surface without interfering with the completion of combustion.

Barber Jet Gas Burners for over fourteen years have been so improved and advanced in mechanical construction that today, low operating cost is the selling theme of all Barber Dealers. These burners are designed for low first cost, low operating cost, and so developed mechanically that they have reached the highest point of safety and efficiency, accord.ng to the manufacturers.

Public Interested in Automatic Heat

In addition the public is responding to the publicity given automatic heat and are now interested in this type of home comfort. Barber Jet Gas Burners will convert any hot water, steam or furnace system into even, completely automatic heat. The manufacturers state installation is simple and inexpensive, owing to the fact that nothing in the existing system must be replaced.

No. 330-B Barber Automatic Burner

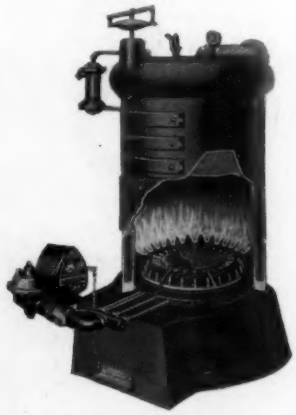
The accompanying illustration of a No. 330-B Barber Automatic Burner installed in a round Steam or Hot Water Boiler shows the proper adaptation of the heat to the side walls at the proper water level, utilizing all of the B.t.u. developed from combustion. Therefore it becomes necessary that the diameter of the burner enable the flame to scrub the side walls in order to obtain proper heat application. For this reason Barber Burners for round Steam and Hot Water Boilers are provided in seven standard sizes and diameters.

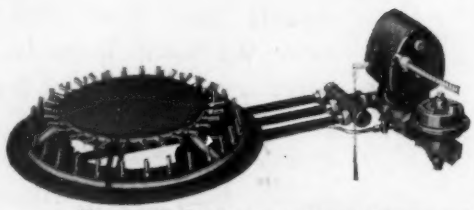
For square and oblong sectional boilers having grate dimensions up to 48 by 98 inches, over 3280 various assembly layouts are provided. In other words, such oblong boilers are built to specifically suit the boiler grate dimensions, and to precisely apply the heat to the side walls for highest consistent and proper efficiency. The illustration shows the adaptation of a special four unit burner properly installed in an oblong boiler.

Determining Proper Burner Equipment

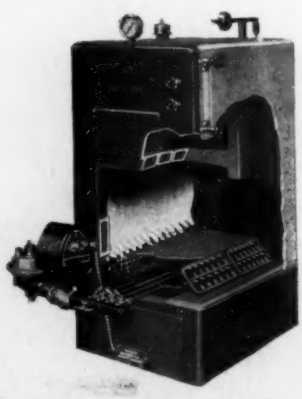
In their efforts to make every installation 100 per cent perfect. the Barber Burner Company states it must depend upon the co-operation of the gas man by his carefully measuring each boiler in line with Barber instructions, ordering the exact burner specified and being absolutely sure it is properly installed. This includes proper size meter, gas supply from meter to burner as well as regulation of drafts.

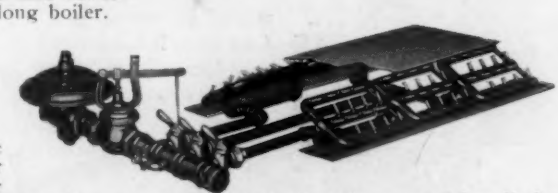
Information on proper covering of grate surface as well as baffling over and through flue openings in sections is desired. Further, the use of fire brick or refractory material in combustion chambers. These suggestions are the result of exhaustive tests and will apply with but slight variance to every type and make of coal burning furnace or boiler.





No. 330-B Barber Automatic Burner and installation in round steamer Hot Water Boiler





Special Four Unit Burner and installation in Oblong Boiler

A demonstrating outfit, the company points out, will help clinch many sales. Further information on the complete Barber line will be gladly furnished upon request to the Barber Burner Company, Cleveland, Ohio.

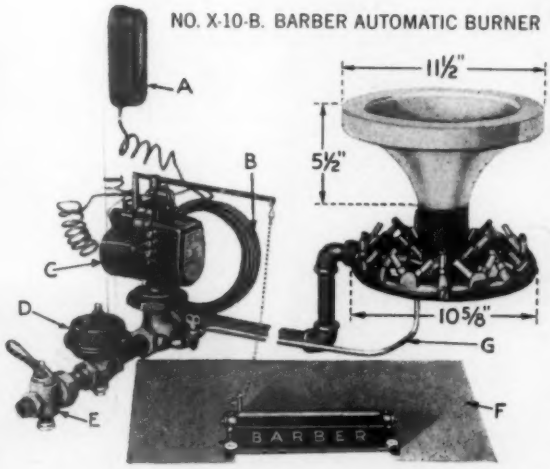
A Sensational Evolution in Gas Conversion Burners

AN IMPROVED QUALITY BURNER WITH UNEQUALLED PRICE APPEAL—ONE THAT DEVELOPS SATISFIED GAS HOUSE HEATING CUSTOMERS. DEPENDABLE, EFFICIENT, ECONOMICAL for FALL, WINTER AND SPRING—

TEN IMPORTANT REASONS

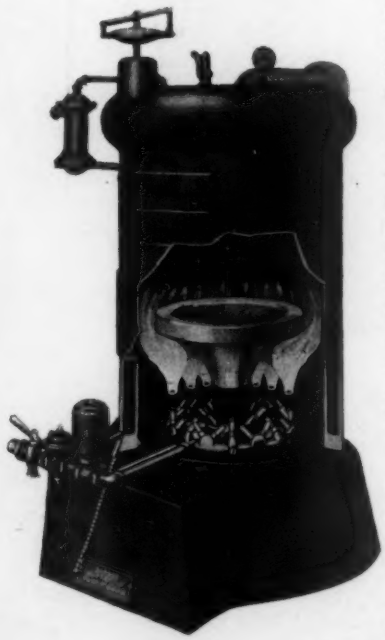
- **Noiseless**
- **Will Not Back-Fire**
- **Scientifically Built**
- **Requires No Servicing**
- **No Air Mixer Adjustment**
- **Will Not Deposit Carbon**
- **Quickly and Easily Installed**
- **Develops 1900° Flame Temperature**
- **For Furnaces and Boilers up to 22'**
- **Made to Convince Hesitant Prospects**

NO. X-10-B. BARBER AUTOMATIC BURNER



NOTE THESE FEATURES

- **(A) No. 4010 Minneapolis Plain Thermostat**
- **(B) 25 feet of Insulated three cable wire for connecting thermostat**
- **(C) No. B-2210 Minneapolis Motor Valve**
- **(D) Barber Gas Pressure Regulator**
- **(E) ¾" A.G.A. Lever Handle Valve with Union**
- **(F) Butterfly Draft Door with Special Lift Assembly**
- **(G) Individual Pilot. Completely Assembled**



NOW there is a demand for NEW Manual and Automatic Controlled Gas Conversion Burners by Gas Companies, Gas Appliance Merchandisers and Heating Contractors—for five, six and seven room homes—that could be sold and installed at a moderate price and still prove durable, efficient, economical.

Barber Engineers have developed a high grade line of No. X-10 Burners to meet this demand—in FIVE models—from the Manual Control type to the completely Automatic with Safety Pilot Control, in an amazing low price range.

No. X-10 Barber Burners are not the cheapest on the market, even though they are priced amazingly low,—but they can be installed in less time and at less expense than any Conversion Burner on the market, which is a big factor in the initial cost to the home owner. They are NOT only for Spring and Fall heating, but for the entire Winter—year after year.

They are made of the best materials—at prices in keeping with DEPRESSION times. They provide a means of supplying Gas Heat, Comfort and Convenience for installation in the present Furnace or Boiler—without removing grates. The New Barber No. X-10 Burners do more—they prevent high gas bill complaints caused by uneven or fluctuating gas pressures.

Gas Companies, Gas Appliance Merchandisers and Heating Contractors can develop a large and profitable business upon these New No. X-10 Burners, if they will connect them up in their display rooms, for Demonstration with Gas, No. X-10-M and No. X-10-B Burners.

Check up upon the component parts of these new Barber Gas Conversion Burners to convince yourself that they have real merit.

Our new, liberal and attractive stock quantity discounts, together with our Sales Helps will be sent immediately upon request. Write us today.

THE BARBER GAS BURNER COMPANY
3702-04 SUPERIOR AVENUE - - CLEVELAND, OHIO

Niagara Auxiliary House Heating Equipment

Niagara Junior Gas Furnace Specifications

The Niagara Junior, designed for homes up to seven-room size is A.G.A. approved. All heat is extracted except for proper flue draft. Choice of steel-wall or all-cast iron radiating sections. Cast iron recommended for manufactured or natural gas; steel-wall radiating sections can be used in some sections with natural gas. Equipment includes patented design secondary air control, operating by damper and rod from gas cock; automatic down draft damper; U. S. Bureau of Standards approved gas burners; safety pilot; gas pressure regulator; shut-off valve and double casing with live air space insulation. Air filter, room thermostat, air washer and electric blower are available controls and equipment. Automatic humidifier is furnished. Standard unit is complete for gravity system installation. Flat or pyramid top furnished as required. Finished in permanent baked-on crystalline red with black trim. This model is one of the newest to be introduced by the company in its endeavor to provide for sales agents a furnace for the average home.

Niagara Gas Space Heaters

These space heaters are a new development in design and construction for use in garages, service stations, factories, stores, churches, schools and other places. Three sides are fitted with metal grilles of cane design. Casing is uninsulated. Radiating sections are steel-wall or all-cast iron, depending on whether artificial or natural gas is to be used. Standard controls are safety pilot, indicator shut-off valve, gas pressure regulator, draft hood. Available controls are graduated temperature control, humidifier. Made in four capacities with B.T.U. input ratings from 48 to 90 thousand. Baked-on green and black crystalline finish.

Complete data on details of standard equipment and other information will be supplied on request.

Niagara 110 Gas Furnace Specifications

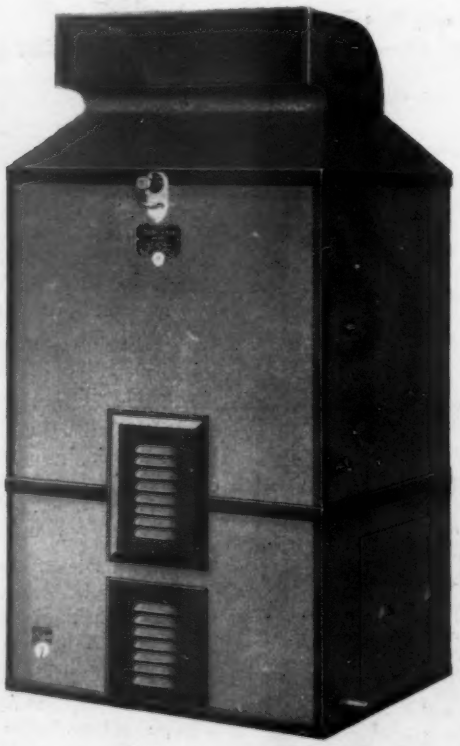
This furnace may be installed with or without blower equipment. Installed with blower it may be placed at any desirable location in the basement, distributing and return ducts installed between joists and beside beams. When installed for straight gravity circulation, provision is made within casing for installation of blowers and filters at any future time, without changing original design.

The Niagara 110 is entirely self-contained, built in two compartments, the upper containing generating equipment, radiating sections, gas burners, controls and automatic humidifier, the lower containing the blower and filter equipment.

Air to be warmed is drawn into lower compartment through approved type air filters. Two blowers of proper size and speeds that can be varied to meet individual conditions, force the air into upper compartments, "scrubbing" the heat from the sides of radiating sections, automatically humidified and forced through distributing ducts. Gas valves are controlled by room thermostat, blowers being started and stopped by a limit control, actuated by the temperature within the casing.

Niagara 110 is built in a complete range of sizes, with hourly B.T.U. input ratings from 90 to 220 thousand. Three sizes are of single-unit construction with input ratings from 90 to 150 thousand B.T.U. per hour. Two sizes are double-unit construction with B.T.U. input ratings per hour of from 180 to 220. These furnaces are finished in mar-proof crystalline green or red with black trimming.

Further data on this equipment can be secured from the Forest City Foundries Co., Cleveland, O.



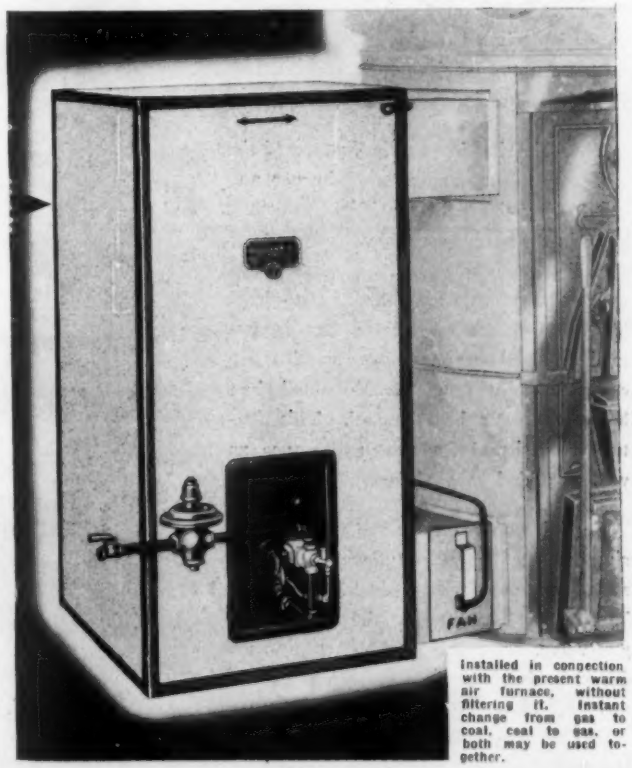
Niagara Model 110

You Can Make a Real Showing in NEW LOAD— *with* NIAGARA *Auxiliary*

Here is the perfect solution to your problem of how to build new load now. Here is a gas furnace your customers can **afford to buy and use now**—a new idea in gas heating—a gas partner to the coal furnace—that enables Mr. Average Homeowner to enjoy the luxury of gas heat in spring and fall, and the milder weeks of winter, **at ordinary heating cost.**

With Niagara Auxiliary you both win. Your customer gets the benefit of the extra comfort and convenience of gas heat nearly all winter, at practically no increase over the cost of his present fuel. You get from 60% to 80% of his heating load—NEW LOAD—in spring and fall, when you need it most.

It opens an entirely new market for gas heating—brings you five times more prospects—with a load building opportunity three times as great. If you have been interested only in all-winter gas heating, consider the tremendous possibilities this new development opens for you.



Installed in connection with the present warm air furnace, without filtering it. Instant change from gas to coal, coal to gas, or both may be used together.

NOW IS THE OPPORTUNE TIME

There never was a more opportune time to introduce Niagara Auxiliary than right now. Fully twenty-five per cent of the homeowners on your lines can afford to heat with gas this economical, practical way. And the very fact that business is hard to get—that incomes are reduced, makes the opportunity for Niagara Auxiliary even greater. Complete plans for a concentrated sales drive are ready for you now. Let us explain these plans to you in detail.

NIAGARA

AUXILIARY GAS FURNACE

THE FOREST CITY FOUNDRIES CO.

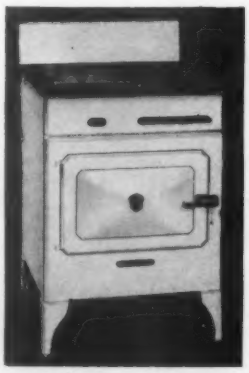
2500 W. 27th Street CLEVELAND — OHIO

Construction and Operating Features of New Chambers Gas Range Line

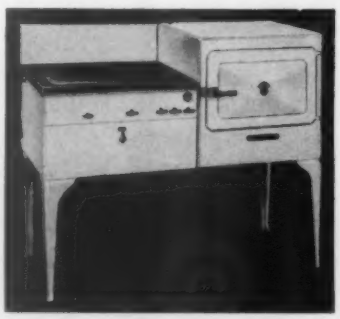
The new super-insulated oven Chambers Gas Range, which cooks with the gas turned off, a feature introduced with the new line, is ventilated and, according to the manufacturers represents the height of efficiency. The top grate, "distributor top," gives an even heat distribution and hot spots are eliminated. It conceals the burner and prevents boiled over foods from dropping on to the burner. This range is designed to give closed top effect with open top efficiency. It represents a new departure in cooking top design.

The drip ring is another feature of the new range, surrounding each burner and eliminating the drip pan. This drip ring rests in the burner opening directly beneath the distributor plate. It is porcelained enamel and easy to remove and clean. The valve control is a feature that is centralized. All burner valve handles are centralized into one panel located just below the oven heat control. This feature is designed for neat appearance as well as added convenience.

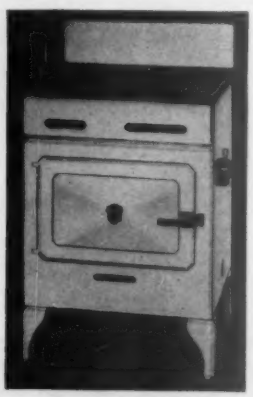
To light a top burner the gas must be simply turned on. No matches are necessary, and no buttons need be pushed. The burner is lighted at the turn of the gas valve. A neatly designed top cover, forming the back splasher when raised, unfolds, giving the covered appearance when the range is not in use, covering the entire cooking top. It is porcelained enameled and matches the finish of the range, adding to its appearance.



6120 TG—Insulated, heat controlled, fireless oven, "In-a-Top" broiler and griddle and two burners. Can be sold for $89.50.



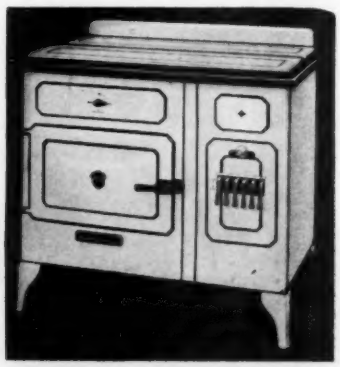
6220 TG—Insulated, heat controlled, fireless oven, "In-a-Top" broiler and griddle and two burners. Also utensil cabinet. Can be sold for $99.50.

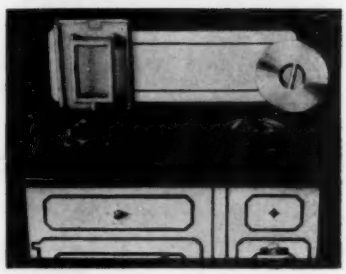


6140 T—Insulated, heat controlled, fireless oven, four burners. Can be sold for $79.50.

1140 TG—Insulated, heat controlled, fireless oven, "In-a-Top" broiler and griddle and four burners. Can be sold for $99.50.

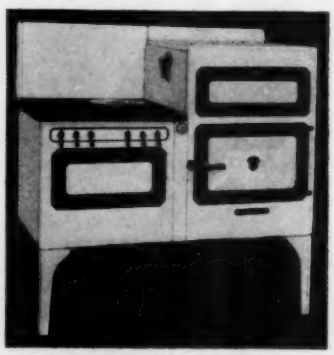
6241 T—Insulated, heat controlled, fireless oven, Thermowell, four burners. Can be sold for $119.50. (Not illustrated.)





1141 TG—Insulated, heat controlled, fireless oven, Thermowell, "In-a-Top" broiler and griddle, and four burners. Can be sold for $149.50.

Two Views. Cover down—griddle up—half view.



1041 TG—Insulated, heat controlled, fireless oven, Thermowell, standing height broiler and four burners. Also utensil cabinet. Can be sold for $149.50.

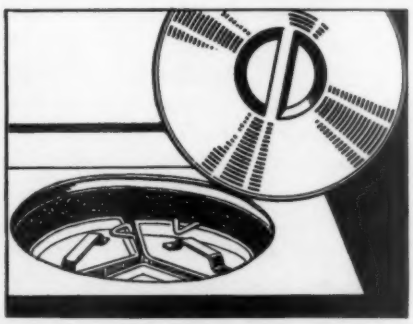
"IN-A-TOP" BROILER AND GRIDDLE. The burner, located beneath the polished cast griddle, supplies heat for both broiler and griddle. The broiler pan is raised and lowered automatically with griddle plate. The location of the "IN-A-TOP" broiler is convenient and prevents stooping. Found in no other range.

For complete information address Chambers Manufacturing Company, Shelbyville, Indiana.

Mr. Gas Executive:

MEET ELECTRIC COMPETITION WITH

Chambers Fireless Gas Ranges



INSULATED, VENTILATED GAS THERMOWELL—The Chambers Patented Thermowell is a heat-retaining well, built into and flush with the cooking top. The burner is located in the bottom and is lighted by an instant safety lighter located at top of Thermowell. Keeps food hot from six to ten hours after the gas is turned off.

CHAMBERS OVEN HEAT CONTROL—The Chambers Insulated Oven is equipped with the nationally known Automaticook Oven Heat Control, together with the Chambers Patented control of oven vents and gas valve. These features permit an exact measuring of heat to insure perfect results in cooking; then permit the gas to be turned entirely off, simultaneously closing the oven vents with one operation. The food completes cooking with retained heat. It actually "cooks with the gas turned off." No other gas range has these exclusive features.

These are just two of the many Chambers outstanding features

Read below the statement of a prominent gas executive who has made a study of

"Gas Versus Electricity for the Cooking Load"

"Let me tell you manufacturers something—it's up to you to build into a gas range a new method of cooking to help the Gas Industry to meet the competition of other fuels. Gas Ranges today are cooking in the same way as they did yesterday. There has been no progress in the method of cooking with gas since its beginning. The Electric Industry, competing with gas for the cooking load, is getting our customers, not because their fuel is cheaper, but because they are out-selling us with a cooking service. It's time the Gas Industry realized this fact and quit trying to meet the inroads of electric cookery with price and terms. Sell the range which will deliver the most cooking service and answer the housewife's problems, using gas as a fuel."

The above statement DESCRIBES EXACTLY WHAT THE CHAMBERS FIRELESS GAS RANGE WILL DO to help you hold and increase your present cooking load. It is the range which delivers THAT NEW METHOD OF COOKING and gives more service, using gas as a fuel.

Note its many features and compare them with the ranges you are now selling. You will realize we have "built something into this range in addition to the stove." This "something" is the answer to your electric competition for the cooking load. *More Cooking Service in a Range Using Gas as a Fuel.*

Chambers Manufacturing Company

SHELBYVILLE, INDIANA, U. S. A.

Features of Faraday Gas Refrigerator Construction

The new model F-7 Faraday gas refrigerator has a food storage capacity of 6.8 cubic feet. Its shelf area is 13.4 square feet. Dimensions, exterior, width 28½ inches, depth 25 9/16 inches, height with legs 65⅝ inches (without legs 56¼ inches). The interior width is 22⅜ inches, depth 17½ inches and height 33⅞ inches. Door swing 22¼ inches.

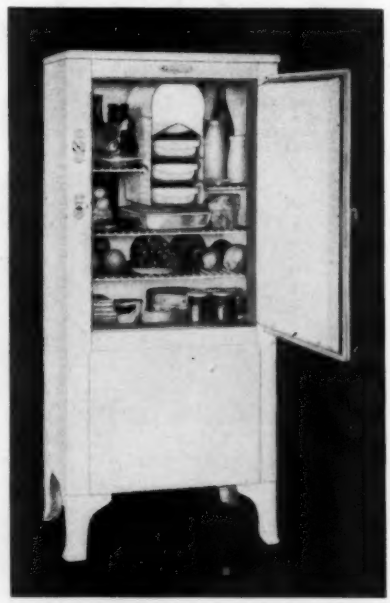
Model F-7 Open Door

Remote Installation

Refrigerator is shipped as a complete unit but absorber may be installed remotely anywhere within 50 feet. Only connection between chilling unit in cabinet and absorber is a single one-fourth inch copper tube. Ice making, 3 trays, 63 ice cubes, 9 lbs. of ice. This model is equipped with exterior temperature control for faster freezing. Defrosting position is provided so user can defrost unit without completely shutting off refrigeration.

Cabinet Description

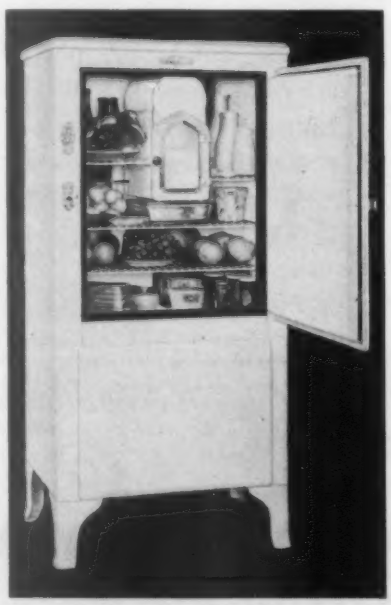
The interior of the cabinet is of white, vitreous porcelain—on steel lining, acid resisting where stains are most likely to occur. Porcelain on steel chilling unit. Removable defrosting tray of heavy glass. Removable bar type shelves with a "tilt" shelf to provide space for bulky articles, tall-bottle compartment and storage space on both sides of the chilling unit. A lower shelf is also divided for extra convenience. The exterior is of white, vitreous porcelain, porcelain on steel panels, even on back of cabinet. Distinctive hardware of brass, heavy nickel, chromium finish. Heavy, reinforced frame, mounted on legs or casters. Door is sealed with heavy composition gasket. This new refrigerator is insulated with new type insulation of aluminum. Non-deteriorating and sealed to prevent infiltration of moisture. Equipped with acid-resisting porcelain bottom.



Model F-4 Open Door

Operating Principle

The Faraday Refrigerator operates on the solid absorption principle, using strontium chloride powder with lithium nitrate as a binder for the absorbent. The refrigerant is liquid ammonia, and a fluorinated hydrocarbon liquid transfers the heat to and from the absorber. When refrigeration is needed the ammonia vapor is evaporated from the strontium chloride absorbent by heating the absorbent. This causes the ammonia vapor to flow through the condenser. It changes to a liquid and continues to the chilling unit. The absorber is connected by a single tube to the freezing unit in the food compartment. The absorber unit is compact and, if desirable, can be located on a shelf or in the basement at a distance of several feet from the freezing unit in the food compartment. Its placement does not in any way interfere with the operation of the temperature regulator which remains on the cabinet.



Model F-5 Open Door

Origin of Name

The Faraday Refrigerator unit is the result of research development of many years. Three household sizes are being marketed: 4.1 cu. ft.; 5.2 cu. ft. and 6.8 cu. ft. Cooling unit is the same for all three models. The name Faraday was selected for the refrigerator in honor of Michael Faraday, born in 1791, an English chemist, who was among the first to make an important study of chlorine. He also made the first rough experiments on the diffusion of gases. In 1847 he discovered the magnetic character of oxygen and also the magnetic relation of flame and gases. It was the development of his pioneering research that has resulted in the perfection of the Faraday Gas Refrigerator.

Further details furnished upon request to the Faraday Refrigeration Corporation, Dayton, Ohio.

A MESSAGE OF IMPORTANCE TO THE GAS INDUSTRY

The introduction of the FARADAY Gas Refrigerator has gone steadily forward during the past year.

The introductory schedule has been conservative, yet this new Gas Refrigerator has already received the approval of many important Gas Companies. Both performance and the policies of the manufacturer have proven so satisfactory that Faraday Refrigerator is now included in the future plans of these Companies.

We appreciate the cooperation which we have received from the Gas Industry. This cooperation has been very helpful to us in building with the aid of expert engineering skill and adequate resources a refrigerator which we believe measures up fully to the high standards of the Gas Industry—one which, by its efficient and care-free performance, will make friends for the Gas Industry —one which will give your customers a new appreciation of gas as an economical, reliable and dependable service for the home.

Faraday specifications are shown on the opposite page. Notice its advanced improvements — continuous refrigeration even while defrosting; faster freezing of ice cubes, and more of them; improved interior arrangement; temperature control; porcelain finish inside and out; flexible installation. And, in addition, the FARADAY Refrigerator is a product of General Motors.

Exclusive distribution of the Faraday Refrigerator through Gas Utilities and their retail outlets is progressing steadily. Distributing arrangements are now being completed with a number of additional Companies. If you are interested in tentative plans for your territory, we'll be glad to hear from you.

FARADAY REFRIGERATOR CORPORATION

DAYTON, OHIO

Construction Features of New Universal Gas Ranges

The Cribben & Sexton Company, Chicago, Ill., introduce several new models, additions to their well known Universal Range line. Following are condensed descriptions of these new models:

Strand Universal Model 422-1 TT

Full Insulated Ovens; Two Automatic Oven Heat Controls Combined with Gas Valves; In-A-Drawer Broiler; Two Automatic Instantaneous Top Lighters; Three Standard Duplex and Three Giant Duplex Burners; Proper Sized Oven and Broiler Burners; Insulated 18 inch Bake Oven; Insulated 16 inch Pastry Oven; Two Counterbalanced Lift-Up-Tops covering Burners and Grates; Cutlery Drawer with Removable Porcelain Tray; Porcelain Oven Linings; Sanitary Porcelain Burner Compartment; Porcelain Burners and Grates; Porcelain Top Plate; Bakelite Gas Valves and Pendant Door Handles; Safety Lighting Device for Two Bake Ovens; Cast Front; Cast Frame Cooking Top; Cast End Rails Top and Bottom.

Dimensions: Baking oven, 20″ deep, 14″ high, 18″ wide; Pastry oven, 20″ deep, 7½″ High, 16″ wide; Broiling oven, 16½″ deep, 7½″ high, 16″ wide; Cooking top, 21″ deep, 35½″ high, 42″ wide; Overall dimensions, 26½″ deep, 41″ high, 45½″ wide. Priced to retail at $159.50.

Oxford Universal Model 24 T

Oven Insulation; In-A-Drawer Broiler; Automatic Oven Heat Control; Automatic Instantaneous Top Lighter; Two In-A-Drawer Utensil Compartments; Built-In Flue Deflector; Porcelain Burner Box Compartment; One Duplex, One Standard and Two Giant Burners; Proper Sized Loop Broiler and Oven Burner; Porcelain Anti-Smoke Broiler Pan; Porcelain Burner Tray; Porcelain Oven Linings; Porcelain Grates and Burners; Two-tone Bakelite Gas Valve and Pendant Door Handles; Full One-Piece Porcelain Back Splasher; Porcelain Lift-Up-Top Covering Burners and Grates; All Control Valves Grouped on Instrument Panel; Sturdy Cast Iron Frame Construction.

Dimensions: Baking oven, 20″ deep, 14″ high, 16″ wide; Broiling oven, 17½″ deep, 8½″ high, 16″ wide; Cooking top, 21″ deep, 35″ high, 21″ wide; Overall length, 41½″. Priced to retail at $97.50.

Newport Universal Model 224 T

Oven Insulation; In-A-Drawer Broiler; Automatic Oven Heat Control; Automatic Instantaneous Top Lighter; In-A-Drawer Utensil Compartment; Cutlery Drawer; Built-In Flue Deflector; Porcelain Burner Box Compartment; One Duplex, One Standard and Two Giant Burners; Proper Sized Loop Broiler and Oven Burner; Porcelain Anti-Smoke Broiler Pan; Porcelain Burner Tray; Porcelain Oven Linings; Porcelain Grates and Burners; Two-tone Bakelite Gas Valve and Pendant Door Handles; Full One-Piece Porcelain Back Splasher; Porcelain Cast Iron End Shelf; All Control Valves Grouped on Instrument Panel; Sturdy Cast Iron Frame Construction.

Dimensions: Baking oven, 20″ deep, 14″ high, 16″ wide; Broiling oven, 17½″ deep, 8½″ high, 16″ wide; Cooking top, 21″ deep, 34″ high, 21″ wide; Overall length, 41½″. Priced to retail at $89.50.

Insulated Oven; Automatic Oven Heat Control; Automatic, Instantaneous Top Lighter; One Duplex, One Standard and Two Giant Burners; Proper Sized Oven Burner and Broiler Burner; Porcelain Broiler Pan and Burner Tray; Porcelain Oven Linings; Porcelain Burners and Grates; Two Utensil Storage Compartments; Two Cutlery Drawers; Removable Porcelain Cover Tray; Two-tone Bakelite Gas Valve and Pendant Door Handles; All Control Valves Grouped on Instrument Panel; Cost Iron Oven Front Frame; Full One-Piece Porcelain Back Splasher.

Dover Universal Model 6224-T

Dimensions: Baking oven, 19½″ deep, 14″ high, 16″ wide; Cooking top, 18¾″ deep, 35½″ high, 17¾″ wide; Overall size of top, 23″ deep, 35½″ high, 42″ wide; Utensil compartment (two), 20½″ deep, 20½″ high, 9½″ wide; Cutlery drawer (two), 18″ deep, 4¼″ high, 7¼″ wide. Priced to retail at $69.50.

Thames Universal Model 6522-T

Insulated Oven; Automatic Oven Heat Control; Automatic, Instantaneous Top Lighter; One Duplex, One Standard and Two Giant Burners; Proper Sized Loop Broiler and Oven Burners; Porcelain Broiler Pan and Burner Tray; Porcelain Oven Linings; Porcelain Burners and Grates; Service Drawer; Two-tone Bakelite Gas Valve and Pendant Door Handles.

Dimensions: Baking oven, 20″, deep, 14″ high, 16″ wide; Broiling oven, 20″ deep 8½′ high, 16″ wide; Cooking top 21″ deep, 33″ high, 19¼″ wide; Overall floor space, 41¼″ wide—22″ deep. Priced to retail at $59.50.

STRAND UNIVERSAL

*"At last a range that meets with 100% approval of the housewife."

** Taken from an ad on the Strand by one of the largest Gas Utilities Companies.*

Why the Strand has met with phenomenal sales success—

1. Extra capacity to meet any home cooking need—50% in excess of ordinary range —meets the cooking requirements of a banquet for 40 or luncheon for two.
2. Compact—requires *only* 45 inches of floor space.
3. Large 18 x 20 inch insulated oven, controlled by individual automatic oven heat control.
4. Smaller 16 x 20 inch insulated pastry or baking oven, controlled by individual automatic oven heat control.
5. In-A-Drawer Broiler.
6. Six Duplex Top Burners, with two automatic instantaneous top lighters. Each burner has a simmering section—saving gas and making for a cooler kitchen.
7. Great flexibility of equipment—assuring greatest economy and convenience in operation.
8. Sells at a price substantially lower than any range offering comparable cooking capacity.
9. Priced to retail at $159.50.

The Strand is a range of great sales possibilities

The Strand Universal represents the gas range at its highest point of perfection. It is definitely superior to any existing domestic cooking appliance, as there is no range on the American market that can compete with it on any basis of comparison — Value — Economy — Convenient — Flexibility of Service — Beauty and Compactness of Construction.

Proved on the battle field of competitive selling, the Strand has achieved remarkable public acceptance; one large utility company selling a total of 104 Strand Ranges in 23 days.

The Strand opens up a great potential market, that, prior to its introduction, had not even been scratched — as the barriers of price, size and unwieldly design were too great to overcome.

The Strand eliminates the factor of excessive price—compact, it is comparable in size to the ordinary range and as to design it is truly ultra-modern. Thus, it overcomes all sales obstacles. Of particular importance, it nets a substantial profit per unit sold.

CRIBBEN & SEXTON COMPANY

Manufacturers Universal Gas Ranges

700 North Sacramento Blvd. *Chicago, Illinois*

Latest Developments in Home Air Conditioning

The past six months has brought to light distinct advances in air conditioning units for the home. The most convenient air conditioners are gas heated, for obvious reasons.

The first step in warm air heating toward air conditioning was in forced circulation of air. New type blowers developed by the Henry Furnace & Foundry Co., Cleveland, Ohio, provide large deliveries at low top speeds, which results in extremely quiet operation. These blowers are readily adjustable to any condition since they are capable of developing capacities of 700 to 5,000 cu. ft. per minute.

Cleaned air is a benefit that appeals tremendously to all women. As a sales point, it eclipses many others of greater importance. Filters for home air conditioners are now available for as high as 93% efficiency. When a device is added which also *washes* the air, it leaves nothing to be desired, for "washing" is a term that carries the utmost conviction with every woman.

Gas Househeating Inexpensive

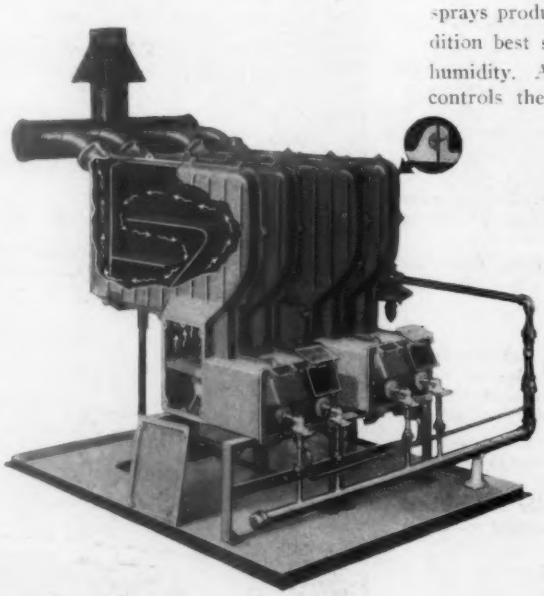
No longer can it be said that gas heating is expensive. The most recently designed heating units fully embody the well known principle of "long fire travel." By compelling the ignited gases to take a horizontal route, their flow is so retarded as to permit the B.t.u's. to be better taken up by the heating units and transferred to the circulating air.

Gas furnaces are now priced within the range of the average man's pocketbook, and further, the simple gravity circulation gas furnace may be gradually converted into a complete air conditioner.

After the gas furnace is installed, in due time a blower may be added and thereafter such other devices as the owner can afford, until the system is complete.

The modern air conditioner is compact. It may be placed at the most convenient point in the basement with the pipes run overhead against the ceiling, entirely out of the way.

Another benefit of an air conditioning system is its use for cooling in summer.



Heavy Cast Iron Heating Units With Long Gas Travel

"B" Series Moncrief Gas Furnace

Cool air drawn from the basement and circulated throughout the house produces a decided cooling effect.

The new air washer presents another advantage of very great importance—that of humidifying the air.

Uniform Flow

Air is drawn in uniform flow through sprays producing a very fine mist—a condition best suited for providing adequate humidity. A solenoid valve automatically controls the water supply and filters in the spray heads catch the dirt in the water.

Moncrief Heating Units

Recently designed Moncrief heating units embody the principle of long fire travel, by compelling the ignited gases to take a horizontal route. Their flow is retarded so as to permit the B.t.u.'s to be better taken up by the heating units and transferred to the circulating air. These gravity circulating furnaces may be gradually converted into a complete air conditioner. Great radiating surface is a feature of the De Luxe Moncrief Model, the manufacturers stating this surface insures greater durability and efficiency. For further particulars address the Henry Furnace & Foundry Company, 3471 East 49th Street, Cleveland, O.

Booklet on Ideal Boilers for Large Buildings

"Ideal Heating for Large Buildings" is the title of a new catalog just issued by the American Radiator Company, 40 West 40th St., New York City. This booklet illustrates and describes their large type Redflash and Water Tube Boilers. These boilers are made in sizes for larger buildings and when used in batteries, any heating capacity can be supplied. Copies of this catalog may be obtained upon request.

Leaflet Describes Safety Shoes

The Mine Safety Appliances Co., Pittsburgh, Pa., have just published a leaflet describing and illustrating their new line of protective footwear. Prices of the various types of shoes are given. Copies may be obtained upon request.

MONCRIEF

Gas Heating AIR CONDITIONER

Sets a new high standard in warm air heating with washed humidified circulating air

All the benefits of modern air conditioning—heating, filtering, washing, humidifying and circulating the air—are afforded by this improved gas heating air conditioner.

Further, the Moncrief has made some astonishing records for low gas consumption. Careful check of units in actual operation from Minnesota to Florida shows that the Moncrief can be depended on to provide most economical heating under widely varying conditions.

Cast iron heating units with long horizontal gas travel contribute to make Moncrief Gas Furnaces and Air Conditioners by far the most economical.

The Moncrief Gas Heating Air Conditioner is equipped with every device to produce convenient, carefree heating comfort, including Blower—electrically driven and automatically controlled—Electric Valves, Limit Control, Pressure Regulator, Safety Pilots, Air Filters, Automatic Washer and Humidifier with Humidistat for regulating humidity.

The Moncrief is in every way a superior air conditioner, moderately priced.

Send for complete descriptive literature.

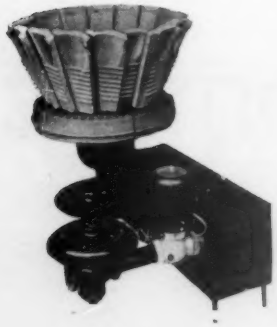
Fully Approved by The American Gas Association

Manufactured by

THE HENRY FURNACE & FOUNDRY CO.

3471 East 49th St. Cleveland, Ohio

Roberts Gordon Burner Line Varied



Roberts "G" Burner

The Roberts "G" Burner illustrated has been designed for quick installation. It is equipped with Emco Gas Pressure Regulator, Minneapolis V-15-1 Motor Gas Valve and Minneapolis Thermostat.

Roberts SR Rectangular Burner

The Robert SR Rectangular Burner is made in three stock sizes for grates from 12½ inches in width to 18 inches in width and from 18 inches in width to 39 inches in depth. It is equipped with Minneapolis Thermostats and controls. The custom made Rectangular Burner is built to fit any size boiler or furnace, either for commercial or house heating purposes.

Roberts Standard Burner

The Roberts Standard Burner has complete air control, a feature designed to prevent cold air entering and cooling the fire pot when the burner is not in operation. Air is directed to point of combustion. Air duct is of Armco iron. China Clay radiants are so placed as to

direct heat against walls of the fire pot. Drawn steel Venturi mixing tubes form a part of the equipment of this burner which is also equipped with Minneapolis Thermostats and controls, including motor valve.

Roberts round burners are made in four sizes, 12 inches; 16 inches; 20 inches and 24 inches, to fit grate diameters from 13 inches to 32 inches. These sizes will fit the round boiler or furnace in the homes of average size.

Roberts Junior Burner

The Roberts Junior is a simply constructed, automatically controlled unit introduced for the lower priced field. It is fully equipped with Minneapolis Thermostats and controls.

Roberts Arcola Burner

The Roberts Arcola Burner is manufactured to fit each and every size of Arcola Boiler. It is equipped with Minneapolis Thermostats and controls.

These and other controlled gas heating units are fully described in the latest

catalog issued by the Roberts-Gordon Appliance Company, Delaware Avenue at Tupper Street, Buffalo, N. Y.

Gamon Meter Company to Work with Worthington

An arrangement has just been made for the joint use of the manufacturing, engineering, sales and service facilities of the meter division of Worthington Pump and Machinery Corporation and those of the Gamon Meter Company, whose plant is located at 282-296 South Street, Newark, N. J. The sales staffs of both organizations will report to and be directly responsible to Mr. George H. Gleeson who will head up the meter sales activities of both companies.

The lines made by these two companies are supplemental to each other, with the result that the products of both companies will continue to be produced as heretofore and together make a complete line of disc, current or turbine, compound and piston meters for measuring all liquids, such as hot and cold water, oil, grease, gasoline and brine.

The Gamon Meter Company, founded in 1910, its Watch Dog trademark, and its line of disc, current and compound meters, are favorably known throughout the United States.

Bernitz Furnace Co. Appoint Representatives

Bernitz Furnace Appliance Company announce that Mr. Ernest R. Jefferson and Mr. Frank A. Lobee, Jr., operating under the name of Insulation and Refractories Co., 841 Elmwood Ave., Buffalo, N. Y., have been appointed as representatives for western New York State. Mr. Jefferson has severed connection with Striegel & Jefferson, Inc., New York City, and Mr. Lobee was formerly with McLeod & Henry Company as sales representative in western New York.

They further announce that Lloyd R. Leatherman, formerly of their New York office, is appointed District Sales Manager of the Chicago and Detroit district. The Chicago branch office of the company is located at 360 North Michigan Ave., Chicago, and the Detroit branch office at 2241 Book Building, Detroit.

ROBERTS "G" BURNER

-- a quality burner at a competitive price!

Listed as Standard by the Underwriter's Laboratories in the U. S. A.—in Canada by the Hydro Electric Power Commission.

- - - and having the same high efficiency as all other Roberts Burners.

The Roberts "G" Burner is designed so that a minimum of time is required for installation and small interruption of heating service is assured.

Equipped with Emco Gas Pressure Regulator, Minneapolis V-15-1 Motor Gas Valve and Minneapolis Thermostat.

We strongly recommend that you place your orders for this burner at as early a date as possible. Shipments are now being made from our new factory in Buffalo.

ROBERTS-GORDON APPLIANCE CORP.

Buffalo, N. Y.

Factories at 21st and X Sts., Lincoln, Nebraska, and Buffalo, N. Y.

ROBERTS
CONTROLLED
GAS HEATING UNIT

Bimetal and Heat Control

Thermostatic Bimetal is two metals united by riveting, brazing or welding, one metal possessing a *high* co-efficient of expansion and the other a *low* co-efficient of expansion. When exposed to heat or temperature rise, the material of high expansive properties will expand or lengthen, the other material being of low expansive properties will have little or no movement. The result is a bending of the Bimetal. When temperature drops again, the high expansive material shrinks back into its original length and the Bimetal straightens back to its original shape. Should the same piece of Bimetal be subjected to

This illustrates a piece of metal of high expansion properties, a metal which, when subjected to heat, expands to a greater extent than the average metal.

Here is illustrated a piece of metal of low expansion properties or in other words, a piece of metal, which when subjected to the heat, does not expand to as great an extent as the average piece of metal.

cold, it would bend in the opposite direction and straighten out again with rise in temperature.

Because of its extreme sensitivity to temperature change, Thermostatic Bimetal is now used to control many kinds of devices automatically. In each case, the Bimetal is shaped or formed to fit into the product design—and is of a particular combination of metals best suited to the operating temperature which the device requires. It is a scientifically recognized fact that each time a given piece of Bimetal is subjected to the identical temperature change it will deflect to the same degree. One piece, or a million pieces, of identical metallic formula and identical size, will react identically time after time.

Chace Thermostatic Bimetal

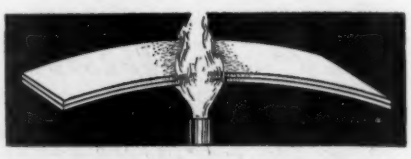
The manufacturing of Chace Thermostatic Bimetal is an exact science. Chace engineers offer the device manufacturer every assistance in securing the Bimetal that will function best in his product. Chace Bimetals are uniform. Every attention is paid to secure exact formula in each lot of Bimetals put through. The welding, rolling and finishing is done under critical supervision. As a result, Chace Thermostatic Bimetal is widely used by manufacturers whose products must operate faithfully at red heat or under unusual conditions.

Chace Thermostatic Bimetal is sold in sheets, strips, or in formed parts to meet the buyer's specifications.

Chace Bimetal is used for safety pilot light controls; thermostats for water heaters; oven regulators for gas ranges; draft regulators for gas furnaces; room temperature thermostats; controls for domestic appliances and other automatic controls.

Chace Thermostatic Bimetal is especially adapted for high temperature applications such as pilot light controls and will stand 1200 degree fahrenheit (red heat) without distortion. Further information pertaining to Bimetal will be sent upon request to the W. M. Chace Valve Company, Detroit, Michigan.

Here is illustrated the above two metals joined together. That is, a piece of high expansion metal and a piece of low expansion metal and the combination results in Bimetal.



When heat is applied to Bimetal, it bends because of the difference in expansion properties of the two metals that have been welded together. When this same piece of Bimetal cools again, it straightens back to its original shape.

New Conversion Gas Burner

Bialosky Bros. & Co., Cleveland, O., announce the "Paramount Conversion Gas Burner."

It is a blower type burner, consuming from 30 to 150 cu. ft. of gas per hour.

It is installed through the ash pit door.

The burner head and baffle plates are put in the furnace through the firing door, resting on the grate bars. It can be installed or removed, in less than 10 minutes.

Each of the component parts—motor blower, gas pressure regulator, mechanically operated gas valve and burner head are designed for synchronous operation with each other and form one compact unit.

It is equipped with a Paramount room thermostat and safety pilot light.

The burner head, circular or rectangular is of heavy cast iron with a series of vertical slots around its outside periphery and is set so that the flame is projected horizontally and directly at the full inner lower surface of the fire pot. Rising, both flame and hot gases are confined to a space of 1½" from the fire pot by heavy cast iron baffles until near the top of the fire pot where spiral spacer blades swing the hot gases of combustion into a swirling motion that holds them into close contact with the upper walls of the combustion chamber, until going to the furnace radiator or to the boiler flues.

The gas supply valve is operated by a fly-ball governor on the lower end of the motor shaft. Before the valve is opened, air is blown through the burner. Air is also blown through after valve is closed to clean out all residue and unburned gases.

Secure Automatic Temperature Control

. . . . through the use of

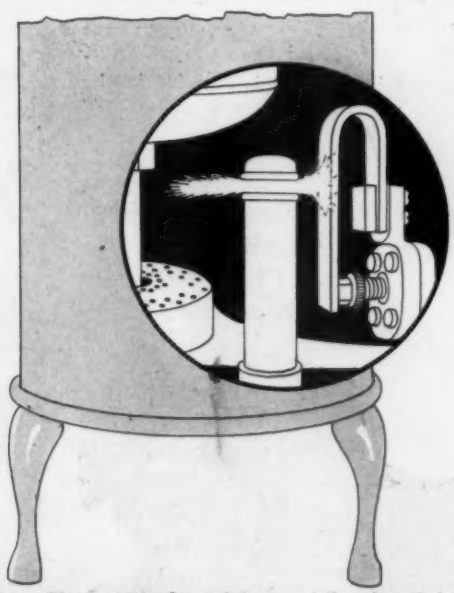
CHACE THERMOSTATIC BIMETAL

"It Bends With the Heat"

Chace Thermostatic Bimetal is sold in sheets, strips, or in formed parts to meet the buyer's specifications. Chace engineers are at the service of users and prospective users of Bimetal.

Used for :—

Safety Pilot Light Controls
Thermostats for Water Heaters
Oven Regulators for Gas Ranges
Draft Regulators for Gas Furnaces
Room Temperature Thermostats
Controls for Domestic Appliances
and
Many Other Automatic Controls



Chace Thermostatic Bimetal is especially adapted for high temperature applications such as pilot light controls and will stand 1200 degree fahrenheit (red heat) without distortion

Manufactured By

W. M. CHACE VALVE CO.

1610 Beard Ave. Detroit. Mich.

Gas Burners for Industrial and Domestic Use

Johnson Junior Gas Burner for Home Heating

The Johnson Junior is a simple, compact gas home heating burner for low cost installations. Available stripped or with any optional equipment. A popular unit in the South and in natural gas areas. Complete information is supplied in the latest Johnson catalog.

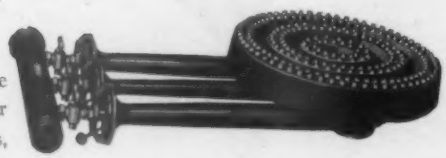
Johnson No. 118 Combination Bench Furnace

This is a combination bench furnace for any shop use. Designed especially for heating the largest soldering coppers, tempering, heat-treating, annealing or soft metal melting. Firebox is lined with heavy refractory lining. The lid on the hood may be removed and a 22-lb. capacity melting pot may be inserted for melting small quantities of soft metal, such as lead, babbitt, tin, zinc, etc. Gas consumption 40 cu. ft. per hour. Length 16". Height 9½". Firebox opening, 4 x 6. Weight 45-lbs.

Johnson No. 305 Melting Furnace

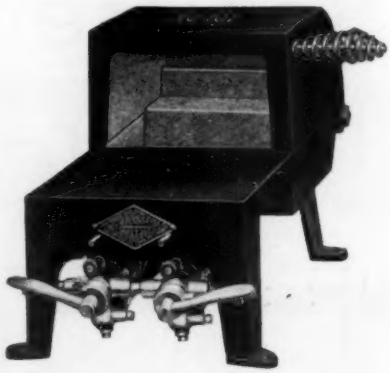
This furnace is fitted with four large burners for melting soft metals, chemicals, etc. Has 300 lb. capacity pot. A draw-off valve from the bottom of the pot and a removable lid are features. The valve will not freeze and will allow metal to be drawn off as soon as melted. Floor type furnace. Steel hoods are heavily constructed of sheet steel with large door for access to pot. Height 31". Weight 185-lbs. Form No. 14, type "A" Bunsen Burners. Gas consumption, 120 cu. ft. per hour. Removable cast iron pot. 13" in diameter by 7½" deep.

Johnson No. 60 Bee Ring Burner



This atmospheric ring burner, of a concentric type, is 15" in diameter, 4¾" high, length center to manifold 19½". Gas consumption 345 cu. ft. per hour. Further information in catalog.

Johnson No. 101 Bench Furnace



This bench furnace is specified for heating soldering coppers up to 12-lbs. per pair, heat-treating, tempering, annealing, case hardening carbon steel tools or small metal parts, such as dies, taps, reamers, chisels, gears, etc. Blower is unnecessary. Equipped with two Johnson Bunsen Burners each with shut-off valve and pilot light. Firebox lined with heavy refractory lining. Shelf in rear of firebox forms a rest and protects points of coppers. A work rest block, for holding parts to be heated, and a baffle plate, which partly closes the front opening of the furnace are furnished with this furnace. Gas consumption 10 to 15 cu. ft. per hour. Length 14". Weight 18-lbs.

Johnson No. 35 B Urn Burner

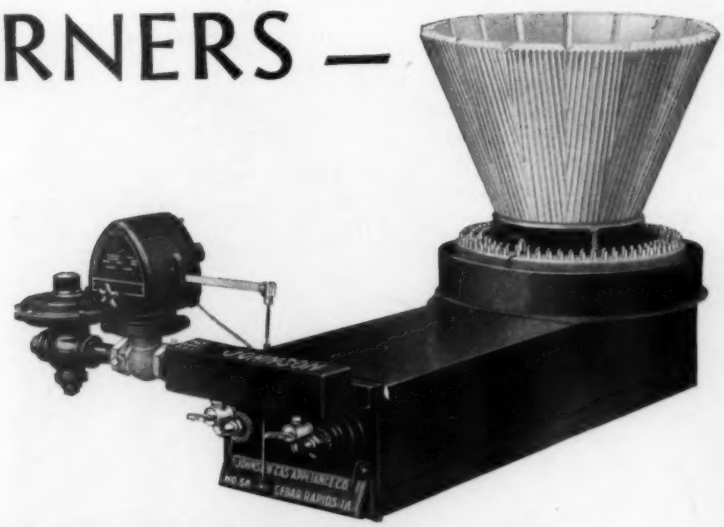
The No. 35 B Johnson Urn Burner with thermostatic heat control is designed to prevent over-boiled coffee and saving in gas fuel costs. The No. 31 Urn Burner is equipped with shut off valve and the same removable burner head as used with heat control. Can be used efficiently with any type of gas.

Johnson No. 700 Heat Treating Furnace

This furnace is specially designed for carbonizing, hardening, annealing, etc., of any carbon steels, which can be efficiently and economically done without the use of expensive motors or blowers. This furnace heats up rapidly and is simple to operate. Heat can be regulated to a fine degree and any desired temperature maintained up to 2150° F. It is strong and durably constructed. Equipped with six powerful large size Johnson direct jet burners. Gas consumption, 240 cu. ft. per hour. Fire box 7 x 11 x 14 in.

The Johnson Gas Appliance Company, Cedar Rapids, Iowa, produces a complete line of standard appliances and are in a position to design and build special burners for any application.

JOHNSON AUTOMATIC GAS BURNERS—



OFFER EFFICIENCY AND PRICE APPEAL

SELLING gas home heating and the Johnson Gas Burners provides two distinct advantages well worth remembering. You are offering the most modern and efficient fuel known—and a burner which utilizes that fuel to the greatest advantage. The Johnson Automatic Gas Burner is a finished product, offering many refinements which can be had in no other burner; and a degree of comfort, cleanliness and safety which no other fuel can provide.

NOW IS THE TIME!

With Winter rapidly approaching, there are hundreds of good prospects who would be glad to hear about the many features of the Johnson Automatic Gas Burner for Home Heating. Write for details today—now is the time to sell.

WRITE FOR OUR LATEST CATALOG

JOHNSON GAS APPLIANCE CO.
Cedar Rapids JOHNSON PATENTED DIRECT JET **IOWA**

Eastern Representatives

R. M. Henshaw & Co., 250 Stuart Street, Boston, Mass.; Steinmetz & Co., 220 So. 16th St., Philadelphia, Pa.; 30 Church Street, New York

New Rudy Air Conditioner Built in Four Sizes

The Rudy Bon-Air Conditioner is built in four sizes and is designed for new or old installation. Controlled circulation of properly tempered, humidified air, washed and filtered is the function of this product. Size No. 60, 60,000 B.t.u. gross input; No. 100, 100,000 B.t.u. gross input; No. 150, 150,000 B.t.u. gross input and No. 200, 200,000 B.t.u. gross input.

No. 200 Rudy Gas Furnace

The center radiating member of the No. 200 furnace is five inches in diameter. The outside flue of each radiating member is connected to a single main flue at rear of furnace. The triple casing consists of an outer casing of 24-gauge cold-rolled iron, an inch air space being maintained by a 24-gauge cold-rolled iron lining. Next there is a two-inch air space and a radiation shield of 18 gauge cold-rolled iron. The ends and sides are constructed for insulation against heat loss through the casing.

Standard Equipment on No. 100 Furnace

The No. 100 Rudy "Bon-Air" Gas Furnace consists of a single heating unit operated by . controls Furnished with triple casing and hood. The casing is constructed of heavy gauge cold-rolled iron furnished in two shades of green lacquer. Heater is complete with casing, pressure regulator, electric gas valve, atmospheric mixer, safety pilot and shut-off burner, main shut-off valve and automatic humidified. Further details pertaining to this equipment will be supplied upon request to the Rudy Furnace Company, Dowagiac, Mich.

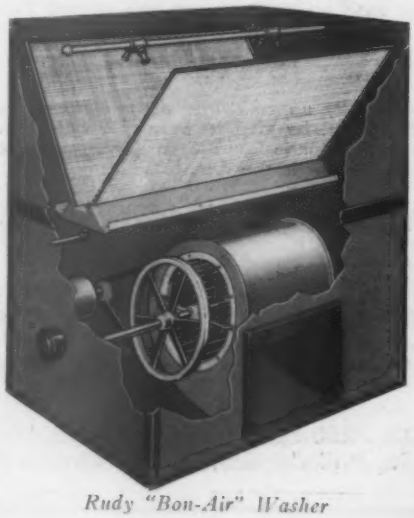
The Blower

The blower unit has been designed to insure correct delivery of the air from the blower outlet to the furnace casing by a low velocity through the inlet. This promotes a uniform flow of air through the entire casing without the use of a baffling system. This result has been accomplished by elevating the blower to get the blower outlet as far away from the casing as possible, yet keeping the cabinet within reasonable dimensions. A connection from the blower outlet to the casing inlet spreads the air and reduces the velocity. Vibration and mechanical noise has been eliminated by the selection of blowers large enough so they can be run slowly and still move the required volume of air. The blower bearings and motor are mounted to obviate vibration of the moving parts transmitted to the frame.

Ball bearings mounted to the frame with rubber shock absorbers and the use of a specially machined drive make for quiet blower operation. Specifications:

Rudy Bon-Air Furnace

No. 1075, free air delivery cu. ft. per minute 1200; motor 1/6 H.P.; motor speed 1725 R.P.M.; size blower wheel 10¾"; speed blower wheel 390 R.P.M. No. 1250, free air delivery cu. ft. per minute 1600; motor 1/6 H.P.; motor speed 725 R.P.M.; size blower wheel 12½"; speed blower wheel 390 R.P.M.



Rudy "Bon-Air" Washer

Rudy "Bon-Air" Washer

The Rudy "Bon-Air" Washer and blower is new in principle. The washer, as shown in the cut-away illustration, contains a filter made of spun glass. A fine water mist bathes the spun glass filters and the circulating air, being forced through the filter is cleansed of dust bacteria and other impurities. The sprays are controlled by a room humidistat to provide the right amount of humidity. The filters are washed as the water floods their surface, the filters acting as flooders and eliminators.

Goodrich Rubber Co. Issues New Catalog

A new condensed catalog giving a simplified, comprehensive line-up of principal industrial rubber goods has just been issued by the B. F. Goodrich Rubber Company, Akron, Ohio.

It is titled "Engineering Data, Industrial Rubber Goods" and is available to those who request it.

Among the condensed engineering data, is Table No. 1, Page 3, on rubber transmission belting, giving at a glance horsepower capacities, minimum pulley diameters, leather belt equivalents and list prices on all commonly used sizes of transmission belts.

Table No. 3, Page 8, on conveyor belts, gives data never before published in this form. It is easy, by following instructions on Pages 8 and 9, to figure the required sizes and plies of a conveyor belt without using a formula.

Table No. 6, Page 11, has never before been published and is a practical means whereby an engineer may estimate the pressure required to deliver a desired amount of liquid through hose of various diameters.

Many other subjects are treated.

American Meter Acquire Westcott & Greis

Announcement has been made by American Meter Company, Inc., of the acquisition of Westcott & Greis, Inc., who for many years have acted as sales agents for American Meter Company products in the mid-continent field with headquarters at Tulsa, Oklahoma. The present sales service located at Tulsa, Dallas and Houston will be continued and no changes in personnel are contemplated. The control of Westcott & Greis by American Meter Company is a further step in completely integrating this company's sales organization under centralized management from coast to coast.

THE RUDY BON-AIR GAS-FIRED FURNACE

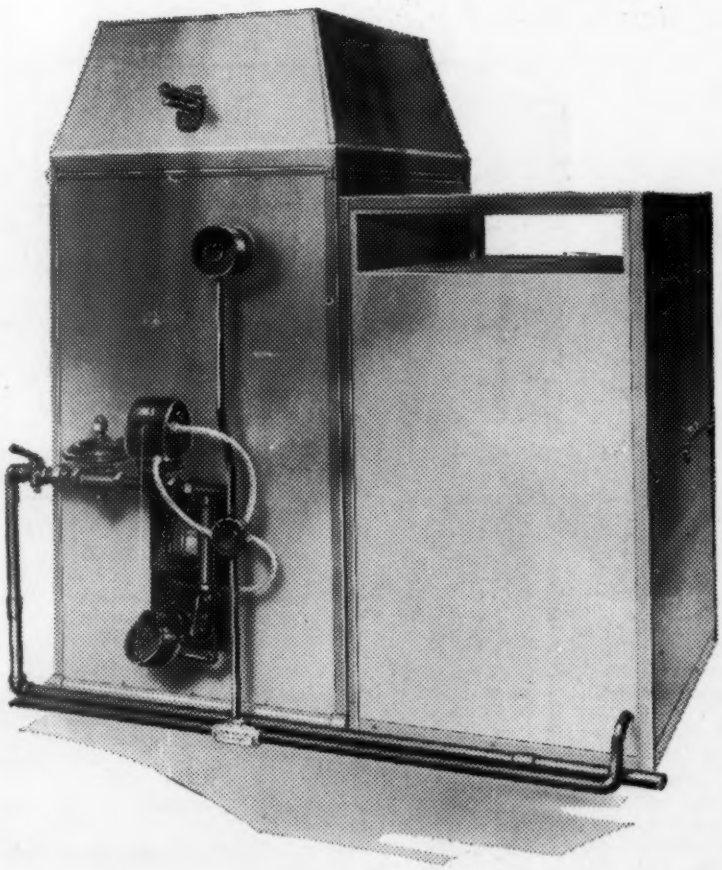
RUDY BON-AIR GAS FURNACES PREVENT COLD 70°

"Cold 70°" is caused by air stratification in the room. To prevent air stratification warm air delivery temperatures must be warmer than room temperatures.

The abundance of cast iron radiating surfaces present in Rudy Gas Furnaces provide a hold-over of stored heat. This stored heat continues to flow thru the warm air ducts after the burner is off and until the thermostat calls for its resumption of operation, keeping duct temperatures slightly warmer than room temperatures.

No low limit controls, minimum burners or other complicated mechanism are necessary with Rudy Gas Furnaces—due to Rudy hold-over.

Simple yet absolutely safe in operation, designed with stream line radiating surfaces to reduce friction, and engineered for a minimum of heat loss in the stack, Rudy Bon-Air Gas Fired Furnaces are accepted for their brilliantly efficient performance everywhere.



Let us prove these claims to you

RUDY BON-AIR GAS FIRED FURNACES

RUDY FURNACE COMPANY

Dowagiac, Michigan

RUDY BON-AIR GAS FIRED FURNACES

WHERE HEAT IS REQUIRED GAS IS DESIRED

New Features of Kompak Water Heater Line

The Kompak Domestic Automatic Storage Heater, made from 20 to 60 gallons tank capacity is designed to give complete hot water service. The copper coil heater under the tank circulates the hot water directly to the top of the tank, giving instant recovery, when standing. This tank is thoroughly insulated, circulation stops and heat is retained. Has automatic pilot and fuse plugs shut off.

No. 20C—Diameter over-all 17½ inches. Height over-all 62 inches. Hot water outlet pipe ¾ inch. Cold water inlet pipe ¾ in. Gas pipe ½ inch. Flue pipe 3 inches. Tank capacity 20 gallons. Crated weight 235 lbs. Copper coil, Stubb Gauge

Domestic Heater

No. 18. Copper Tank, Stubb Gauge No. 17. Gas consumption per hour: artificial gas 45 cubic feet; natural gas 22½ cubic feet.

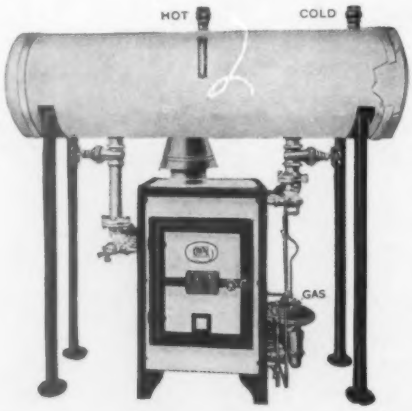
No. 32C—Diameter over-all 20 inches. Height over-all 73½ inches. Hot water outlet pipe ¾ inch. Cold water inlet pipe ¾ inch. Gas pipe ½ inch. Flue pipe 3 inches. Tank capacity 32 gallons. Crated weight 290 lbs. Copper coil, Stubb Gauge No. 18. Copper Tank, Stubb Gauge No. 16. Gas consumption per hour: artificial gas 45 cubic feet; natural gas 22½ cubic feet.

No. 45C—Diameter over-all 22 inches. Height over-all 75 inches. Hot water outlet pipe ¾ inch. Cold water inlet pipe ¾ inch. Gas pipe ½ inch. Flue pipe 4 inches. Tank capacity 45 gallons. Crated weight 435 lbs. Copper coil, Stubb Gauge No. 18. Copper Tank, Stubb Gauge No. 15. Gas consumption per hour: artificial gas 80 cubic feet; natural gas 40 cubic feet.

No. 60C—Diameter over-all 24 inches. Height over-all 77 inches. Hot water outlet pipe ¾ inch. Cold water inlet pipe ¾ inch. Gas pipe ½ inch. Flue pipe, 4 inches. Tank capacity 60 gallons. Crated weight 475 lbs. Copper coil, Stubb Gauge No. 18. Copper Tank, Stubb Gauge No. 14. Gas consumption per hour: artificial gas 80 cubic feet; natural gas 40 cubic feet.

Domestic Heater

The Kompak Type H System is similar in principle to the domestic with horizontal copper tank and Kompak reverse circulation type of heater. Furnished in all sizes from 80 to 1000 gallons, with heater having capacities of from 200 to 500 gallons per hour. Systems furnished complete with tank, stand, heater, covering and circulating pipes.



Kompak Type H

300-Lbs. Test Copper Tanks Guaranteed

It is designed to meet the demand for a complete copper water heating unit for supplying hot water to extra large residences and for apartments up to and including ten families. The Kompak Type H is a new addition to the Kompak line. Three additional sizes of the Type H Kompak, with horizontal boiler, have been added, the No. 60 H has a 60-gallon horizontal boiler and is designed for places where the vertical type would not have sufficient head room. The No. 80 H has an 80-gallon horizontal copper boiler. The No. 100 H has a 100-gallon copper boiler. The 250-lb. test boilers are recommended where the hot water pressure does not exceed 100 lbs.

New Heavy Duty Kompak

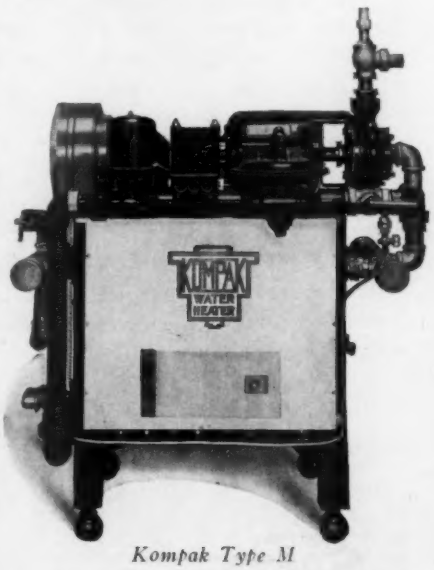
The new heavy duty Kompak Type M water heater for industrial use is said by the manufacturer to set a new standard in hot water service efficiency. It has an electrically operated pump and fan circulates the water and burns the gas. Heating sections are of cast aluminum. There is no condensation. Every part built for heavy continuous service at lowest operating cost.

Cost of operating a Kompak is dependent upon the amount of water used. The average cost for a family without maids is 25 to 40 cents per week per person. All parts of the Kompak coming in contact with water are made of rust-proof copper, brass or bronze. Automatic pilot prevents the escape of gas should the pilot go out. Fusible plug guards against over-heating. On the storage type Kompak the burners do not light until the temperature of the water in the boiler drops from 18 to 10 degrees below the temperature set by the thermostat. When the water is drawn the heater will stand all night without lighting. Tank full of cold water at starting will heat from 45 minutes for the No. 20 20-gallon size; to one hour and twenty minutes for the No. 60 60-gallon size, to heat entire tank from top to bottom. It is not necessary to wait until the whole tank is hot to get hot water. Installations of over 15,000 No. 20 Kompaks have shown it to be sufficiently large for homes with one bath, kitchen and laundry. These storage heaters can be connected to steam furnace for heating water in the winter. The pilot light consumes from 30 to 50 cents per month worth of gas. Kompaks are guaranteed by the manufacturers for two years against mechanical defect. They further state that Kompaks will give service practically indefinitely if burners and coils are cleaned regularly. Further information will be gladly supplied upon request to the Kompak Company, New Brunswick, N. J.

The Kompak Domestic Heater, made from 20 to 60 gallons tank capacity is designed to give complete hot water service. —the copper coil heater under the tank— circulates the hot water directly to the top of tank, giving instant recovery—when standing, tank is thoro ghly insulated, circulation stops and heat is retained—with lowest operating cost per gallon.

The original automatic pilot and fuse plug gas shut off. All tanks 300 lb. test copper, guaranteed for 20 years.

The Kompak Type H system is similar in principle to the domestic with horizontal copper tank and Kompak reverse circulation type of heater. Furnished in all sizes from 8 to 1000 gallons, with heater and having capacities of 200 to 500 gallons per hour.



Kompak Type M

Systems furnished complete with tank, stand, heater, covering and circulating pipes.

The New Heavy Duty Kompak Type M heater for industrial use—This heater sets a new standard in hot water service and efficiency—Electrically operated pump and fan circulates the water and burns the gas. Heating sections are of cast aluminum—No condensation—Every part built for heavy, continuous service at lowest operating cost.

Meeting Competition

GAS—COAL—OIL—ELECTRICITY

FOUR fuels are available to the home owner to furnish his hot water supply—He will adopt that which gives him the most perfect service, with the least trouble and the lowest cost.

Gas has made tremendous strides during these last 10 years. It has largely displaced coal, because it is clean, requires no labor, and automatically gives all of the hot water needed—These advantages outweigh a slightly higher cost.

Something more is required to compete with oil and electricity, not only to secure new business but to keep the old—

KOMPAK firmly believes that only through the installation of high grade copper water heaters, designed to give the customers the best service and the lowest cost of which gas is capable, can the domestic hot water supply be retained and increased. Every Copper KOMPAK has these qualities built in—and every installation is an assurance that the customer will continue to use gas for years to come.

Insure your future by adding KOMPAK to your line in 1933.

The KOMPAK Company

New Domestic and Industrial Thermostats

The No. 2E Thermostat is placed far enough away from the heater so that it will not be affected by the radiated heat from front or side of the radiator. Usually a distance of 8 to 12 inches from the heater is sufficient. The thermostat can be set at any level but should never be placed directly above the heater. The gas line may be run through the body of

No. 2 E Robertshaw Space Heater Thermostat

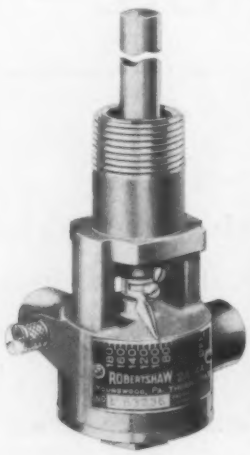
the thermostat in either direction only if the independent pilot connection on the thermostat is not used. If the independent pilot connection on the thermostat is used the gas must enter the thermostat at the connection which is adjacent to the independent pilot connection.

A cock should be placed in the gas line before it reaches the thermostat and unions should be used on each side of the thermostat so that it can readily be connected without strain. Use little or no pipe cement on gas connections. Do not jar valve unduly. See that no strain is placed on thermostat at any point.

The makers state it is rarely necessary to recalibrate this thermostat. It has a patented non-clog by-pass, which controls the minimum burner or by-pass flame. It must be adjusted when heater is installed.

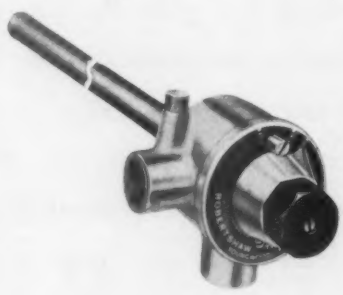
No. 2A Robertshaw Water Heater Thermostat

Straight lift construction, for storage tanks up to 40 gallons capacity. Expansion tube length is suitable for either 12 or 14-inch diameter tanks. This type thermostat is used on either natural or manufactured gas, but when used on manufactured gas, a heater should be selected having a burner which can be turned down to a low point without flashing back in the mixer. Will work in any position. Will not be damaged by overheating where the system is connected to an auxiliary furnace or range. It is a single unit and is equipped with non-clog by-pass. In two sizes, 2A and 4A.



New Robertshaw Coffe Urn Thermostat

This new addition to the Robertshaw line of thermostats is simple in design and is manufactured of sturdy materials for accurate operation, states the manufacturers. This thermostat is applicable



to practically all types and sizes of urns. Periodic cleaning is necessary. No other maintenance. This thermostat is designed for definite temperatures in brewing coffee and reduced fuel consumption. Thermostatic action is secured by means of a couple extending into the water chamber of the urn. This couple is composed of two rust-resisting materials. Model GC is equipped with non-clog by-pass that regulates minimum burner flame. models Cc and Sc Robertshaw Coffee Urn Thermostats are two of many types of automatic temperature controllers. Of particular interest to restaurant owners are Robertshaw Thermostats for steam tables and bake ovens. These thermostats are the result of more than thirty years eperience in this field. The manufacturers state that many Robertshaw Thermostats have been giving perfect temperature control for a generation on all kinds of gas-fired appliances. Complete instructions for installing and adjusting thermostats specified are included with the thermostat when it is shipped. Services of Robertshaw representatives are available to assist in temperature control problems. These representatives have sales offices in New York, Washington, Kansas City, San Francisco, Dallas, Philadelphia, Cleveland, Los Angeles, Buffalo, Pittsburgh, Cincinnati, St. Louis, Omaha, Chicago, Detroit, Birmingham and Syracuse. Specifications on the Robertshaw line will be sent upon request to Robertshaw Thermostat Company, Youngwood, Pa.

General Refractories Co. Now Offer Carbex Line

The General Refractories Company, Philadelphia, Pa., announces that an arrangement has been concluded with the McLeod & Henry Company, of Troy, N. Y., whereby they are now in position to offer to the trade the Carbex (Silicon Carbide) commodities manufactured by the McLeod & Henry Company.

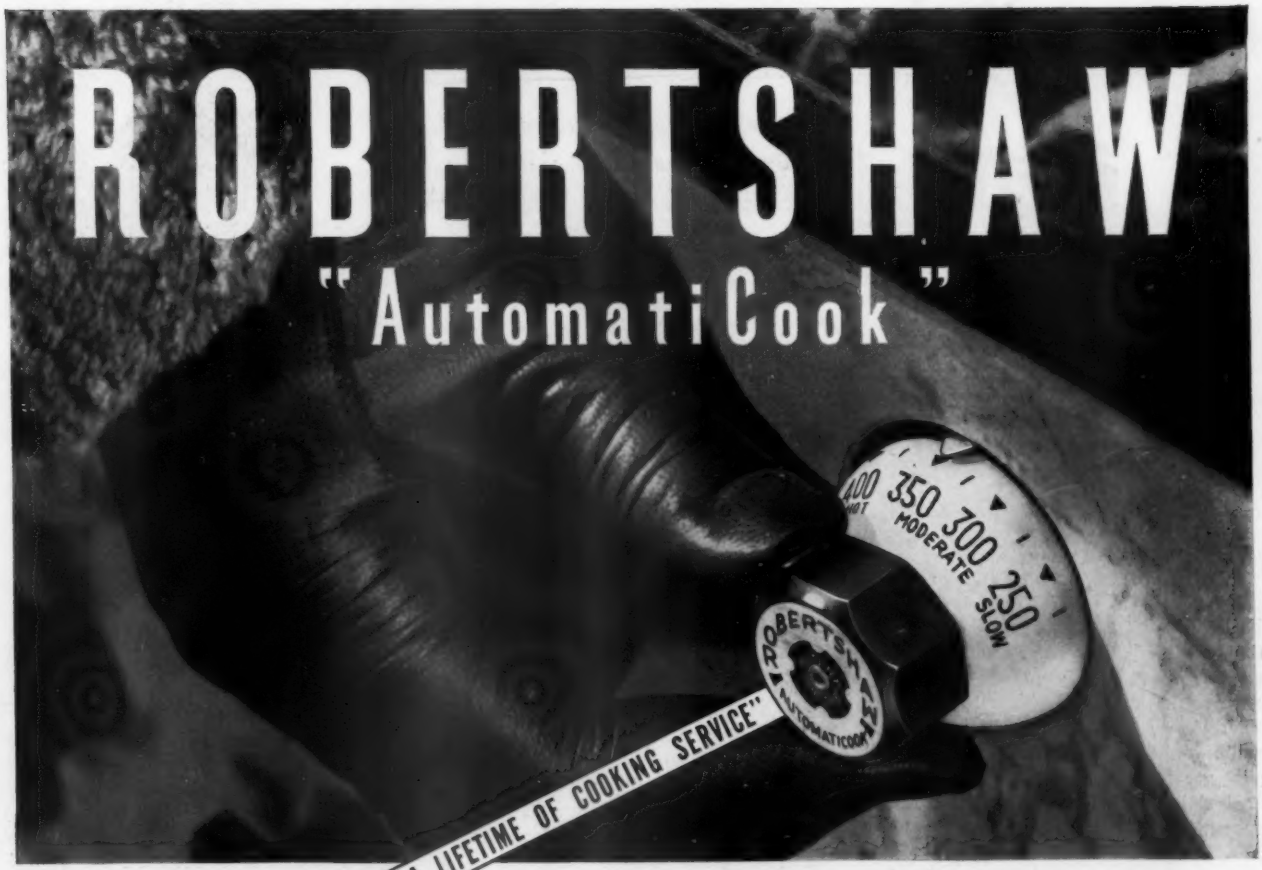
Tenney Appointed Chicago Sales Manager for Lincoln Electric Co.

Appointment of G. E. Tenney as Sales Manager of the Chicago district, is announced by The Lincoln Electric Company, Cleveland, Ohio.

Previous to joining the sales staff of the Lincoln organization Mr. Tenney was engaged in shop, engineering and sales work for the Houghton Elevator Company, Toledo; The Recording and Computing Machine Company, Dayton; and the Moore Drop Forging Company, Springfield, Mass. For the last three of his nine years' service with the latter company, he served in the capacity of Sales Manager.

Mr. Tenney, a graduate engineer from Ohio State University, interlarded his engineering work with four years' service on the Mexican border, the Philippines and the Orient with the United States Army. At present he is a Major in the Reserve Corps.

The Chicago office of The Lincoln Electric Company, located at 1455 West 37th Street, maintains a sales and service organization for all Lincoln products.



NEW MODEL "F" FOR TABLE TOP AND CONSOLE RANGES

MODEL "K" FOR CONSOLE RANGES

Win New Business with ROBERTSHAW

- And win it now!
- For more women are cooking their own meals than ever before.
- And when a woman does her own kitchen work, she rightfully feels that she should have a modern range, equipped to help her in every possible way.
- That means a Robertshaw . . . the cooking control she knows most about through years of advertising and the good reports of her friends.
- Dealers know this just as well as housewives . . . and they also know that it doesn't pay to handicap their selling work by trying to sell a range with a "just as good" oven control, no matter how alluring the price may seem.
- With over 150 Robertshaw equipped brands to choose from, you can always offer the last word in real value and have the selling help of the Robertshaw behind every range you sell.

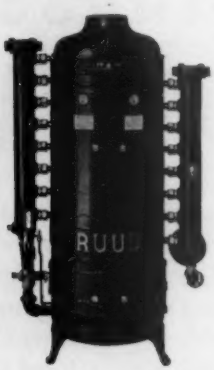
The Robertshaw Lithographed Display will "dress up" your window or floor display. It's free . . . . write for it now.

ROBERTSHAW THERMOSTAT CO.
YOUNGWOOD · · PA.

New Features of Six Major Ruud Types

AUTOHOT SPECIAL
Automatic Storage Water Heater

Full-speed. Quick hot water recuperation. Made in four sizes with tank capacities of 14, 20, 30 and 45 gallons respectively. AUTOHOT Snap-Acting Thermostat, "all-on" or "all-off". Automatic gas cut-off closes both main and pilot gas lines in case of pilot flame failure. All sizes made with either tanks of galvanized iron or copper. With galvanized tanks, the unit is supplied either with or without hand-hole for cleaning hard water deposits.



RUUD MULTI-COIL
Automatic Storage System

In single or multiple installations, this unit is suitable for every Volume Water Heating requirement. Four water heater sizes and many tank combinations in black iron, galvanized iron and copper. With or without steam coils. All-Metal Moment Valve. Automatic gas cut-off. Heavy, premium copper tubing, any of which can be replaced without shutting down the system. Manifolds have a non-corrosive porcelain lining. Two piece, easy-to-clean bunsen burners. Battleship construction throughout.

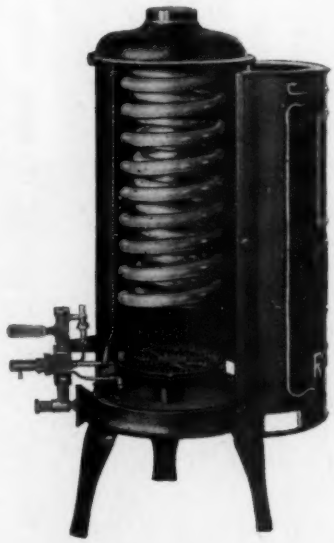
AUTOHOT LOW-SPEED
Automatic Storage Water Heater
(WITH CUSTOMER CONTROL)

Low-speed. C.C. (CUSTOMER CONTROL) Burner is standard equipment and provides a selection of three gas-burning rates so that the customer by making a simple adjustment controls his own gas bill. Three sizes with tank capacities of 20, 30 and 45 gallons respectively. Internal tube construction. High efficiency. Snap-action thermostat, "all-on" or "all-off". Automatic gas cut-off.

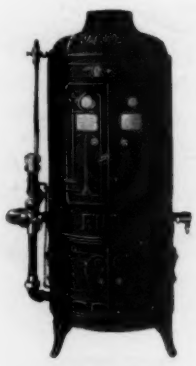
RUUD SIDE-ARM
Automatic Storage Water Heater

Made in three sizes with tank capacities of 24, 40 and 60 gallons, respectively. Snap-acting thermostat, either "all-on" or "all-off". Automatic gas cut-off. The copper coil water heater is separate and independent from the tank, joined by copper water circulators. The hot water injector and dip pipe are copper. Brass fittings and rugged construction throughout. Thick insulation. Heavy tank. Supplied with tanks either of copper or galvanized iron.

RUUD No. 72
Multi-Coil Water Heater

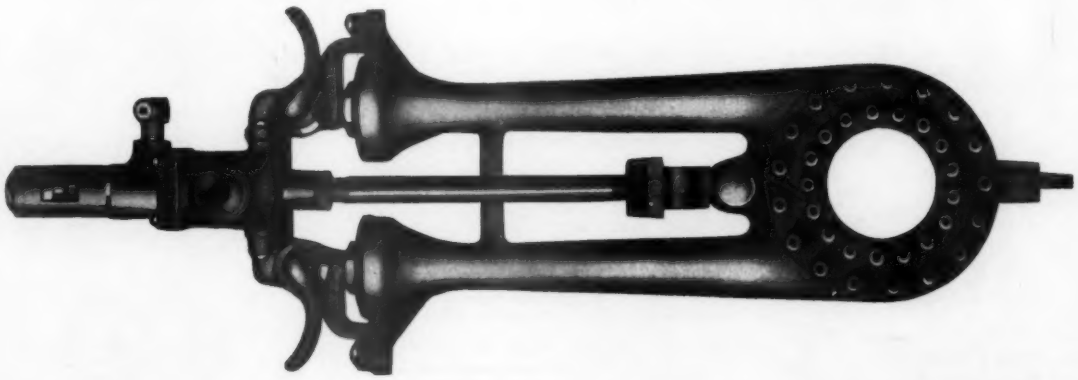


Built in one size to connect to a new tank or to be connected to the hot water storage tank already installed. Installed singly or in battery. Operation is controlled by the RUUD All-Metal Moment Valve. Secondary gas control provided by the automatic gas cut-off. Three heavy copper coils, wound to effective baffle. Powerful unit bunsen burner. Brass manifolds. Heavy cast iron jacket insulated with rock wool around heat zone.



RUUD CONTINUOUS FLOW
Water Heater

This type provides an instant and continuous flow of uniformly-tempered hot water, directly controlled by the opening and closing of the faucet. There is no tank. Five sizes which may be installed singly or in battery. Double fuel control. Automatic gas cut-off. Premium coils, baffle-wound. Full bunsen burners, easy-to-clean. All water-ways are of copper or brass, providing a hot water supply entirely free from rust. These heaters are manufactured by the Ruud Mfg. Co., Pittsburgh, Pa.



CUSTOMER CONTROL

The Latest and Greatest Water Heater Improvement in 10 Years

That's the C. C. Burner—up above. It burns gas at one-third, two-thirds and full capacity as the customer decides. He makes one simple adjustment to regulate the quantity of gas burned. Everything else is automatic.

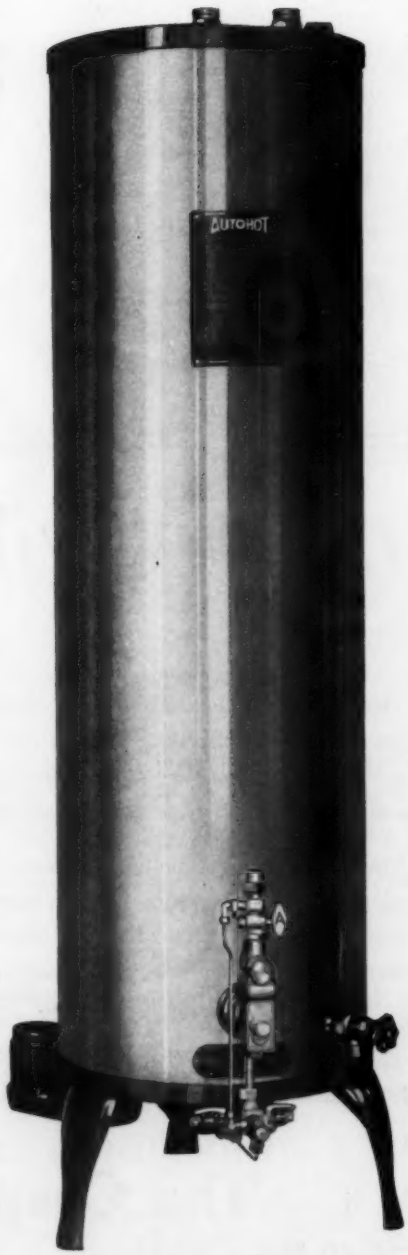
The customer now becomes the judge of his own gas bill and vanishes from the ranks of the gas bill objector.

C. C.—the greatest sales idea presented to the gas industry in ten years.

C. C.—new life for every sales department and a sure and effective answer to the man who says, "I'd like to have automatic hot water service but can't afford the gas bill."

C. C.—standard equipment of the AUTOHOT Automatic Storage Water Heater—at the right.

**WRITE FOR SALES BULLETIN NO. 127.
IT TELLS THE STORY.**



Ruud Manufacturing Company

Pittsburgh, Pa.

Factories in

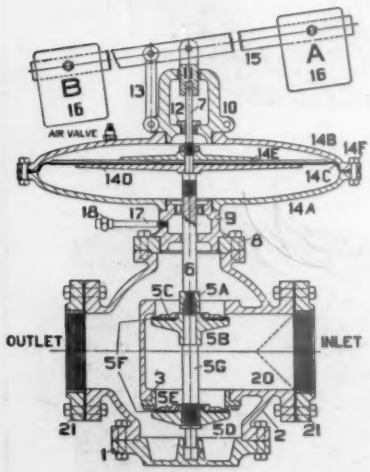
PITTSBURGH KALAMAZOO TORONTO

HAMBURG LONDON

C. C.

Specifications of Chaplin-Fulton Regulators and Valves

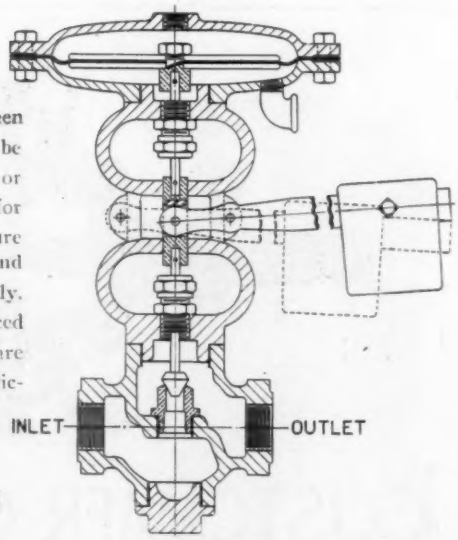
The Fulton Weighted Illuminating Regulator is designed to reduce a minimum pressure of 30 lbs. or less, to any given delivery pressure between one ounce and 5 lbs. It can be used as a district governor, or for individual service. Adapted for reduction of low inlet pressure and can be used where inlet and outlet pressure differs slightly. Equipped with soft-seated balanced valves. Sizes larger than 3 in. are equipped with removable seat. Friction is reduced by absence of stuffing box.



Fulton Weighted Illuminating Regulator

Fulton Differential Relief and Regulating Valves

The Fulton Differential Relief Valve is one of several different types of valves for different types of oil-flogging equipment including the throttling valve. This valve's function is maintenance of a constant differential pressure through by-passing excessive pressure created by booster. This and other equipment for high pressure gas transmission is manufactured by the Chaplin-Fulton Mfg. Co., Pittsburgh, Pa.



Fulton Duplex Sensitive Gas Governor

In order to meet the needs of manufactured and natural gas companies seeking to control a high and varying inlet pressure and reduce it to a low and unvarying outlet pressure for illuminating or fuel purposes, the Fulton Duplex Sensitive Gas Governor has been introduced. It is simply constructed, and, according to the manufacturers, requires little servicing. Catalogue explains its operation in detail.

Unusually Sensitive Control

for High Pressure Gas Transmission

The Fulton Duplex Sensitive Gas Governor is designed to meet the needs of artificial or natural gas companies who desire to control a high and varying inlet pressure and reduce it to a low and unvarying outlet pressure, for illuminating or fuel purposes.

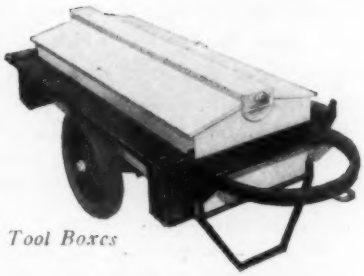
The power to operate this governor is derived from two diaphragms of equal area, moving in opposite directions, but transmitting their power in the same direction. This gives a vast increase in sensitiveness and power over that possessed by a governor with a single diaphragm.

The Governor is easily and quickly installed, and due to the simplicity of its construction, requires but little attention afterward. ***Catalogue on request.***

The Chaplin-Fulton Mfg. Co.

28-40 Penn Avenue **Pittsburgh, Pa.**

Littleford Equipment for Gas Distribution Departments



Tool Boxes

The Littleford HanDeeBox has storage space for all tools needed by service installation and main line crews. Model 8-40 is eight feet long and has 35 compartments; Model 6-40 is six feet long, with 25 compartments. Both boxes have a maximum carrying capacity of 3000 lbs. Timken bearings, semi-elliptical springs, and pneumatic tires are standard equipment.

This tool box, including sliding shelf and partitions, is built entirely of steel; it is much stronger than a wooden box, but lighter in weight. The outside shelves extending completely around the box make it practically a work-shop on wheels; in addition, they materially strengthen the box and serve to protect it. The bottom of the box is strengthened with flanged stiffeners.

An important feature of the HanDeeBox, is the elimination of padlocks. This tool box has one lock that locks the steel covers, wheels, and supporting legs. The lock mechanism and all other features are completely described in Bulletin G-6.

Littleford trailers are made in two and four-wheel models. Carrying capacities range from 1000 to 12,000 lbs. Timken roller bearings and semi-elliptical springs are standard for all trailers. Wheels may be fitted with either solid rubber or pneumatic tires.

Littleford trailers are fitted with bodies of any special design desired.

Trailers

They are used as pole trailers, pipe trailers, and as cable carts.

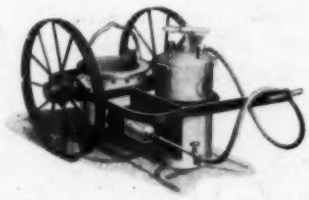
Littleford two and four-wheeled "Hot Dope" Kettles are made in capacities from 10 to 550 gallons. They are used wherever hot coating material is required—on large pipe line jobs, for coupling coating, water-proofing, and work around booster stations.

"Hot Dope" Kettles

Littleford Lead Furnaces are made in both oil and wood burning styles—stationary and portable. Capacities from 250 to 450 pounds.

Littleford Compound Furnaces are made in 10 and 25 gallon sizes—portable and stationary.

This equipment is manufactured by Littleford Bros., Cincinnati, Ohio.

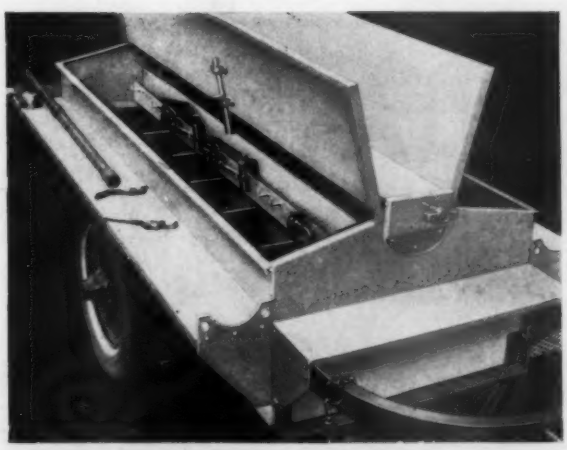


Lead Furnaces

LOST . . . STRAYED . . . *or* STOLEN?

What is your tool loss per year? How many augers, wrenches, lead pots, reamers, saws and what not disappear? You can stop that loss!

The HanDeeBox, an all-steel tool box, is designed and built for gas distribution crews. There are shelves and compartments to take care of the most complicated collection of tools and equipment. It is much stronger than a wooden box—but lighter in weight.



One lock simultaneously fastens both of the double covers full length of the box. Unauthorized persons can't break into this steel tool box.

Economize by eliminating loss of tools. The HanDeeBox will soon pay for itself. Let us send you complete information and prices. Write for Bulletin No. G-6.

LITTLEFORD BROS.

424 E. Pearl St. **Cincinnati, Ohio**

Goodman Stopper 25 Years On Market

The Goodman Gas Main Stopper was placed on the market in 1897 for use on distribution mains for low pressure work. Improvements have been made from time to time. The "Z" Handle is the latest improvement and makes for easier manipulation as it simply, surely and quickly places the stopper in the correct position, where the patented locking sleeve holds it securely against jarring. The genuine Goodman Stopper has the name Goodman on the Locking Sleeve. Carried in stock in standard sizes 3″ to 48″ and made in special sizes on short notice.

Cylindrical Stopper

The Goodman Cylindrical Stopper is an inflatable bag with a fine strong waterproof casing for use in gas and oil pipes. This stopper is pulled into place by cables and will hold back more pressure than any other stopper. The broad central zone making contact with the wall of the pipe keeps the bag from creeping or slipping in the main. It is carried in stock in sizes 2″ to 48″.

Gas Main Bags

The Dependable Gas Main Bags are made in four types: Type "A," light weight plain rubber; Type "B," medium weight, and Type "D" heavy—extra strong; Type C—Canvas Covered Gas Main Bags. The Canvas Covered Gas Main Bag, Type "C," is intended for use in mains coated with tar or oil and wherever a plain rubber bag would not hold. This canvas-covered bag consists of an inner bag of fine quality rubber, strong and expansible, encased in a cover made of best quality duck. The gauge of rubber and strength of duck suited to each size. Carried in stock from 2″ to 48″.

Gardner-Goodman Stopper

The Gardner-Goodman Stopper is a new stopper for low and intermediate pressures. It consists of an inflatable bag mounted in a brass cylinder with plunger for safe and easy insertion and comes equipped with a gauge. For use on cast iron or steel, standard, oversize or undersize mains. Easily inserted in top, bottom or side of main, in open excavation or under pavements. Carried in stock from 2″ to 20″.

The Spring Heel Plug is equipped with our patented Spring Heel which forces the plug in past the fitting and keeps it there until you are ready to release it. Easily withdrawn. Sizes ¾″ to 2″. For further information write direct to Safety Gas Main Stopper Company, 523 Atlantic Avenue, Brooklyn, N. Y.

New Handbook on Anthony Joint

A recent publication of the United States Pipe and Foundry Company, Burlington, N. J., is entitled "Handbook of Anthony Joint Cast Iron Pipe and Fittings." This booklet gives detailed information covering the design and installation of Anthony Joint deLavaud Centrifugal Cast Iron Pipe. Copies may be obtained upon request.

LeFevre Joins Heisler Locomotive Works

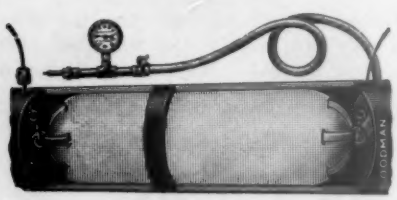
Harvey LeFevre, formerly Sales Manager of the H. K. Porter Co., Pittsburgh, has joined the forces of the Heisler Locomotive Works, Erie, Pa.

— STOPPERS SINCE 1897 —

THE GOODMAN STOPPER

WHEN LOCATED IN PLACE IT HOLDS

GOODMAN CYLINDRICAL STOPPER FOR INTERMEDIATE PRESSURE



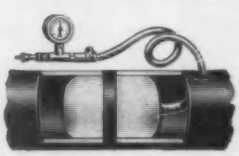
Increased Length for Increased Pressure

Pac. Coast Rep.: C. B. Babcock Co.
135 Bluxome Street, San Francisco
California

DEPENDABLE GAS MAIN BAGS

Made in three types:
Light—Type "A"
Medium—Type "B"
Extra Heavy—Type "D"

DEPENDABLE GAS MAIN BAGS

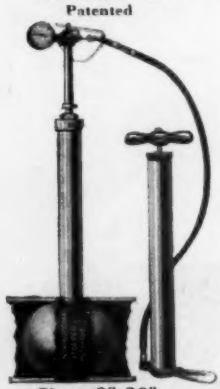


Type C

SAFETY GAS MAIN STOPPER COMPANY

523 Atlantic Avenue
BROOKLYN, N. Y.

THE GARDNER-GOODMAN STOPPER
Patented



Sizes 2″-20″

SPRING HEEL PLUG

New England Rep.
EASTERN APPLIANCE CO.,
250 Stuart St., Boston, Mass.

Dependability All-Important Feature of Purifying Material

Dependability of purifying material is the keynote of the purification process and is the characteristic most in demand by experienced gas men the country over. For the nature of this last treatment which your product receives before passing on to its invisible market, truly determines the success or failure of the whole gas manufacturing system.

What more aptly can the purification plant be termed than the "outpost" of smooth gas works operation? If working efficiently, it is seldom heard from and is frequently forgotten for extended periods, yet the welfare of the entire organization depends upon it. How essential it is, then, that you should have assurance that the working force or iron hydroxide in this modern industrial outpost should answer to the exacting demands of present day purification requirements.

Insuring Good Performance

This demand is met by painstakingly building dependability into every bushel of oxide manufactured, states the Gas Purifying Materials Company, makers of G. P. M. Iron Hydroxide. Unerring regularity in quality and iron oxide content give the same excellent performance in every box filled whether today, tomorrow or next year.

Several years ago, after many years' experience in the manufacture and sale of purifying material, that company conducted a canvass of their customers, both large and small. The result, they found, was a decisive vote in favor of iron boring oxide as being the ideal material for the all round purification of gas. Under the backward, hand made method then in use, however, boring oxide could not show even twenty-five per cent of its potential qualities, which have since been successfully developed and could not compete favorably, on a commercial basis, with other purifying materials.

Accordingly G. P. M. Co. made it their business to find out everything that was known or could be discovered about the manufacture and use of purifying materials. After five years the result is G. P. M. Iron Hydroxide.

It is justly termed by its users, new and old, according to the company, a "revelation" in purification. This explains why the present year has been the most successful in their history and why they report more gas men are turning to G. P. M. Iron Hydroxide. It is now being used by the majority of the larger gas plants in the East.

Iron Hydroxide Preparation

G. P. M. Iron Hydroxide is prepared from quality raw materials, according to the dictates of the latest technical knowledge available, to give the type of iron hydroxide best fitted to purify coal, water or natural gas. Starting with cast iron borings which are chemically treated, the production of G. P. M. Iron Hydroxide follows a carefully worked out and scientifically controlled process in which the oxidation and hydration of the iron hydroxide being formed is brought to a predetermined degree of chemical activity best suited to the purification process.

It is noteworthy that G. P. M. Iron Hydroxide is the only product which is rusted on to the shavings and clings there to the end of purification. The oxide is not washed or carried to concentrated areas, thus eliminating back pressure, channeling and non-uniformity of flow.

The company wishes G. P. M. Iron Hydroxide to introduce itself to you; that is why you will be a welcome visitor at any time to their plant in Long Island City where the steps leading from raw materials to finished product are promised to prove an entertaining lesson in oxide manufacture. Further information and samples will be gladly supplied upon request to Gas Purifying Materials Company, foot of Halsey Street, Long Island City, N. Y.

G. P. M. IRON HYDROXIDE

DEPENDABILITY

Greater Activity—Higher Capacity—Longer Life

explains why it continues to prove

A REVELATION IN PURIFICATION

Gas Purifying Materials Co., Inc.

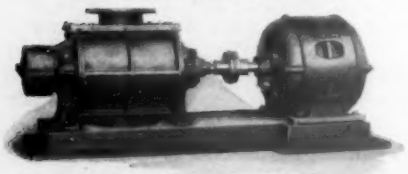
Branch Yard
Providence, R. I.

Oxide
G. P. M.

Foot of Halsey St.
Long Island City, N. Y.

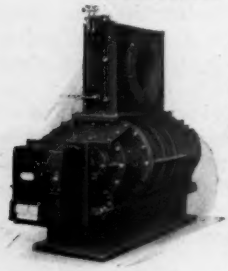
Roots-Connersville-Wilbraham Offer Gas Pumps, Meters, Purging Machines, Etc.

Exhausters and Boosters



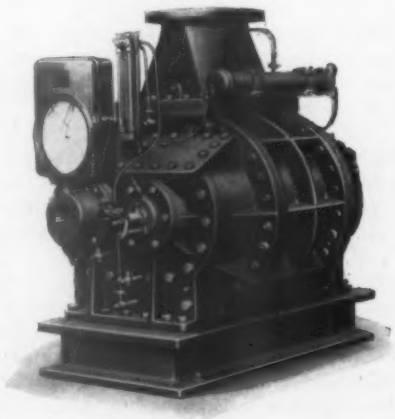
Roots-Connersville-Wilbraham, Connersville, Ind., through combined facilities, offer a wide range of Exhausters and Boosters. Capacities range up to 50,000 cu. ft. per min. at pressures up to 12 lbs. They are built in both the Rotary Positive and Centrifugal types, and are available in all standard driving arrangements. R-C-W Gas Pumps are specially constructed to handle both purified and unpurified gas.

Connersville Meters



Connersville Meters are built on the positive displacement design with timing gears at both ends of the impellers. Bearings are mounted outside the zone of gas flow. All Meters are built of steel or cast iron parts and are accurately machined to insure accuracy of the measuring chambers.

Low-pressure types are suitable for line pressures up to 15 lbs. normal, and in special arrangements the smaller Meters can be supplied for 25 lbs. maximum line pressures. High-pressure types are suitable for line pressures up to 50 lbs. normal, or 75 lbs. maximum peak line pressure. Special steel case Meters for line pressures of 300 lbs. and greater can also be supplied where conditions require.

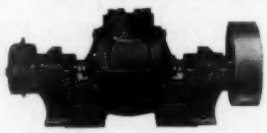


Regular equipment of Connersville Meters includes a totalizing register reading direct in cubic feet, and a U-gauge for differential pressure. Other instruments can be furnished, including the P.V.T.T. Recorder, Demand Recorder, etc.

Connersville Meters are used for measuring station send-out, as well as gas from purifiers to holders; also on industrial consumer installations.

Cycloidal Tar Pumps

R-C-W Cycloidal Pumps are especially adapted to handling tar and other viscous by-products resulting from the manufacture of gas. They are built in both 2-lobe and 3-lobe types.

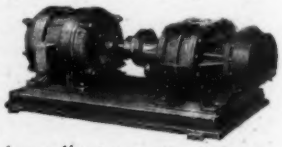


Victor-Acme Blowers & Pumps

Victor-Acme Blowers and Gas Pumps are offered in smaller sizes. Capacities range up to 700 cu. ft. per minute, at pressures up to 7 lbs.

Water Gas Set Blowers

R-C-W Rotary Positive Blowers have been used on water gas sets because they are economical, quiet, and safe. These Blowers are available in capacities and pressures ranging up to 50,000 cu. ft. per min. at pressures up to 30 lbs., as provided in Heavy Duty Compressors. Bearings may be sleeve or anti-friction depending upon service required. Stuffing boxes can be provided, where requirements demand.



R-C-W HARRISON PURGING MACHINE

R-C-W Harrison Purging Machine rated at 35,000 cu. ft. of inerts per hour, at 60° F., against 2 lbs. discharge pressure.

R-C-W Harrison Purging Machines include a blower and gas pump, handling air and gas respectively, which are delivered separately to a water-cooled combustion chamber where the gas burns, forming the inert gas. Drive unit can be either electric motor or gas engine.

Write for Bulletin 100-B10 which gives further details

THERE has been a growing need in the Gas Industry for a machine capable of producing large volumes of inert gas, with minimum oxygen content and under adequate pressure, at a reasonable price. Such a unit finds wide use in purging gas holders, purifying boxes, and distribution lines.

Roots-Connersville-Wilbraham are now building such a machine. It does not require a skilled operator, and puts the troublesome question of purging on an economical basis.

R-C-W Harrison Purging Machines will produce inert gas containing less than 1% oxygen, and zero per cent carbon monoxide, when operating on manufactured or natural gas.

The first unit built was placed in service in October of 1930, and has shown high efficiency and low maintenance cost in almost continuous operation ever since. Machines of this type have been used by several large Eastern gas companies.

R-C-W Harrison Purging Machines have been built in two sizes, rated respectively at 15,000 and 35,000 cu. ft. of inerts per hour, measured at 60° F., against 2 lbs. discharge pressure. Other capacities and pressures can be arranged.

Address the factory or nearest sales office for further information. Literature and prices furnished without obligation.

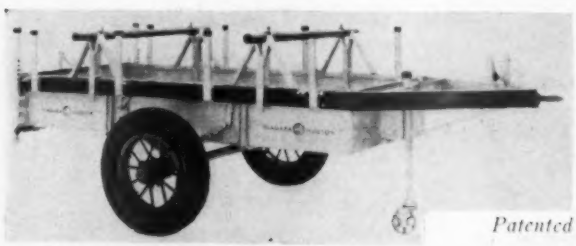
ROOTS-CONNERSVILLE-WILBRAHAM —12th & Columbia— CONNERSVILLE, IND.

NEW YORK — CHICAGO — POTTSTOWN, PA. — ST. LOUIS — DALLAS — SAN FRANCISCO

Mohawk and Hotstuf Equipment for Gas and Electric Companies

Mohawk Hi-Speed Trailer Tool Box

The new Mohawk Hi-Speed Trailer Tool Box has accommodations for tools and equipment. Model G is made in 6, 7 or 8 foot lengths. The body is of 12 gauge steel and partitions and covers of 14 gauge, all steel construction, electrically welded. Shelves are on two sides and in the rear. The Hi-Speed Trailer is equipped with sliding tray, and arrangement of partitions is optional. Master locking device secures both covers and front supporting leg. Tool compartment water and theft proof.

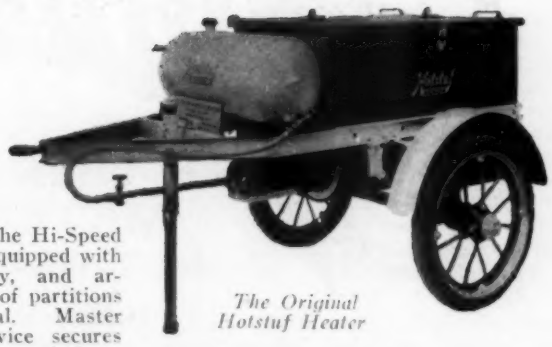


Patented

Mohawk General Utility Trailer

The Mohawk GU-2 General Utility Trailer can be used for hauling poles, and cross arms, as a reel carrier for wire crews, or with reel carriers removed can be used for hauling sand, gravel or concrete, dirt, brush, etc. It has a capacity of two tons, and 30 x 5 inch Firestone cushion tires and roller bearings are standard equipment.

The Original Hotstuf Bitumen Heater is offered in three standard sizes with capacities of 5,000 lbs., 6,500 lbs., and 8,000 lbs. of bitumen in eight hours. Also larger sizes up to 500 gallons holding capacity.



The Original Hotstuf Heater

Hotstuf Lead and Compound Melting Pots are made in 50, 100 and 150 lb. sizes in the leg or stationary models, and in 250, 350 and 450 lbs. sizes on wheels. Details about this equipment will be gladly furnished by the Mohawk Asphalt Heater Co., Schenectady, N. Y.

Hotstuf Lead and Compound Pot

THEY BUY THE MOHAWK HI-SPEED TRAILER BY THE CARLOAD

PART OF A RECENT SHIPMENT TO ONE OF THE LARGEST UTILITY COMPANIES

BECAUSE WHEN IT'S TRAILERS WE ARE LEADERS

STOCK MODELS FOR MAIN AND SERVICE CREWS, SPLICERS, POLES, PIPE, UNDERGROUND AND GENERAL UTILITY WORK, OR BUILT TO YOUR OWN SPECIFICATIONS. LET US SOLVE YOUR TRAILER EQUIPMENT PROBLEMS.

WRITE FOR COMPLETE INFORMATION

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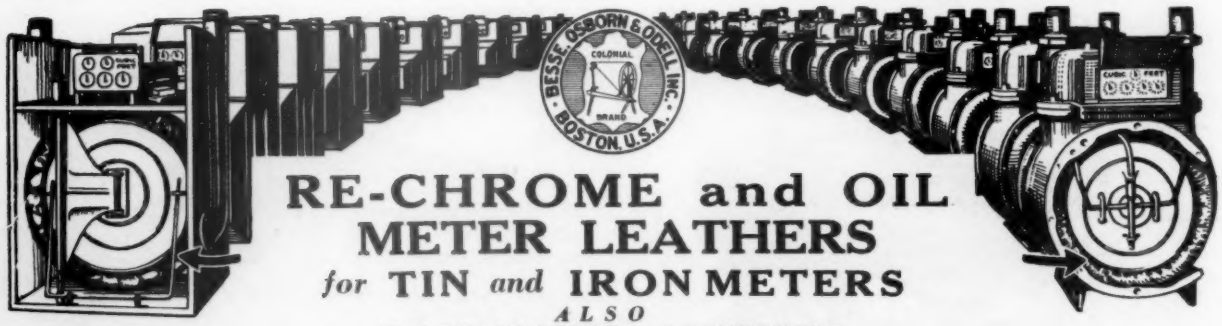
100 PARK PLACE, NEW YORK CITY

—

MOHAWK ASPHALT HEATER CO.
56 WEAVER ST., SCHENECTADY, N. Y.



RE-CHROME and OIL METER LEATHERS
for **TIN** *and* **IRON METERS**
ALSO
FOR REGULATORS *and* **GOVERNORS**

Re-Chrome Tannage has passed the experimental stage and is a proven fact. Since the earliest installation Re-Chrome Leather has made lasting friends among a number of leading gas companies in the United States.

Actual service tests have been going on for *seven* years under all operating conditions and the results show that *Re-Chrome Leather* insures long life and low repair costs.

BESSE, OSBORN & ODELL, Inc., 51 South St. Boston, Mass.

Tanners of "COLONIAL" Meter Leather

N. Y. Representatives—G. N. Bankart & W. A. Smith, 177 William St., N. Y. City

Re-Chrome, Re-Oiled Leather A New Tannage

A new development in meter leathers is the re-chrome, re-oiled leather for use in iron meters. This is an addition to the Besse, Osborn & Odell meter leather tannages which include re-chrome for iron and oiled meter leathers for tin meters.

Varying conditions in the gas industry, such as water gas, coal gas, natural gas, by-product gas and varying basement and temperature conditions have replaced the old-fashioned lambskin tannage.

Three years ago re-chrome leather was introduced to the gas industry. This re-chrome meter leather is made from New Zealand lambskins carefully selected for meter leathers, especially with regard to weight, shape of skins and quality. The leather is marketed under the trade mark "Colonial Brand". It has been through many exhaustive service tests, particularly in localities where there is moisture in the gas.

This leather, of re-chrome tannage, is of a strong fibre and is flexible, making it easier to fabricate in making up the diaphragm. It is stated that diaphragms made of re-chrome leather are less pervious to water, dampness or cold. In addition, re-chrome leather will absorb more oil in the preparation of the diaphragm before being installed in the meter. Water in the gas and climatic changes are said to have but little effect on re-chrome tannage. Longer years of service and more economy in accurate measurement, and no drying out or hardening of the diaphragms are the advantages which the tanners claim for re-chrome leathers.

Furthermore, according to the tanners, re-chrome leather eliminates "floppy" diaphragms; is more flexible, easier to fabricate, sew and crimp; absorbs more oil, is less likely to dry out and harden; stronger fibre, making it more durable; greater resistance to heat and climatic changes; will stand a five-minute boiling test; more accurate measurement of gas; eliminates slow and fast meters; longer years of service and less repairs.

The manufacturers express themselves as confident that the gas industry will welcome the new re-chrome, re-oiled leather in the same fashion as the re-chrome and oiled leathers have been received since their introduction to the meter manufacturing branch of the industry several years ago.

In addition, the manufacturers make up leathers for regulators and governors of various types.

Complete information pertaining to their newest development, re-chrome, re-oiled leather, will be supplied upon request to Besse, Osborn & Odell, Inc., 51 South St., Boston, Mass., or to W. A. Smith and G. Norman Bankart, 177 William St., New York City, N. Y.

Quigley Company, Inc. Announce New Type Refractory

Quigley Company, Inc., 56 W. 45 St., New York, have issued a Bulletin describing "Cast-Refract" a new addition to their line of refractory cements and plasters.

CAST-REFRACT is a new type of refractory with great flexibility of application. It can be cast or molded on the job into any desired shape or form. It airsets quickly with high structural strength, and can be put under full heat within 24 hours, or less if necessary.

Ease and economy of application is an outstanding feature. It is shipped dry, and mixed with water on the job to bring it to a stiff mortar consistency. It is then handled much like a concrete mixture.

This refractory is especially adapted for casting special shapes, boiler furnace and coke oven door linings, and for other more or less intricate refractory construction. It produces a monolithic structure that is air-and-gas-tight, free from shrinkage, highly resistant to spalling and with excellent refractory properties up to its temperature limit of 2600°—2800° F.

Personals

H. R. Jesper has been appointed acting superintendent of branches of the Brooklyn, N. Y., Union Gas Company. He formerly was supervisor of the payroll division.

S. W. Guthrie was recently elected a director of the Los Angeles, Calif., Gas & Electric Company. Mr. Guthrie was assistant general counsel of the company up to March, 1929, when he resigned to establish a private legal practice. He is now a member of the firm of Guthrie and Darling.

T. E. Roach was recently appointed vice-president and general manager of the Washington Gas and Electric Company, Tacoma, Washington, succeeding the late C. Y. Bowers. Mr. Roach has had wide experience in utility operation and was for many years connected with the Union Power & Light Company of Omaha, Neb.

F. C. Foy, assistant general manager of the Seattle Gas Co., Seattle, Wash., recently resigned to accept the position of manager of the J. Walter Thompson Company's Los Angeles office.

Dudley B. Poling succeeds Walter H. Hoagland as gas sales supervisor of the Kentucky-Tennessee Light & Power Company at Bowling Green, Ky.

E. R. Acker has been appointed to succeed the late T. R. Beal as president and general manager of the Central Hudson Gas and Electric Corporation, Poughkeepsie, N. Y.

Harris E. Dexter was recently appointed general commercial manager of the Central Hudson Gas and Electric Corporation, Poughkeepsie, N. Y. He succeeds Mr. E. R. Acker who was named president and general manager.

John Bimson, Jr., after 37 years' continuous service with Public Service Electric and Gas Company, Newark, N. J., and predecessor companies, recently retired. Mr. Bimson at the time of his retirement was superintendent, gas department, Passaic division. He started work in 1895 as a meter reader.

L. Martin Harris was recently appointed superintendent of the Paterson, N. J., district of the Public Service Electric & Gas Corporation. He succeeds Mr. John Bimson, Jr., retired. Mr. Harris was formerly superintendent of the Englewood district.

Robert W. Hendee, senior vice-president of the Oklahoma Natural Gas Corporation, has been placed in charge of the western division with headquarters in Oklahoma City. He succeeds W. P. Canavan, who has resigned.

Robert W. Hendee

Born in Rochester, N. Y., Mr. Hendee came to Oklahoma with his parents in 1915. He subsequently was graduated from Cornell University in mechanical engineering. Mr. Hendee's first position with Oklahoma Natural was in 1921 as assistant superintendent of the gas measurement division, and later he became assistant to former Vice-President A. W. Leonard. In 1925 Mr. Hendee was in Okmulgee as president of the Kingwood Pipeline Company, but returned to Oklahoma Natural in 1926 as general field superintendent. He became a vice-president in 1928 and a member of the Board of Directors.

Ben F. Pickard, vice-president of the Oklahoma Natural Gas Corporation, was recently named vice-president in charge of operations. Mr. Pickard will direct the activities of the district offices, transmission and distribution sys-

Ben F. Pickard

tems, which serve 69 cities and towns in the state.

Mr. Pickard has been associated with public utility enterprises since he first joined the North Carolina Public Service Company in Greensboro in 1909. Prior to joining Oklahoma Natural in 1931, Mr. Pickard was vice-president of Wheeling Public Service Company, Carolina Coach Company, and Whetstone Engineering Company. While associated with the Whetstone organization, Pickard served as the managing director of operating companies located in twelve states and five foreign countries. Among the foreign utilities were light and power, ice and gas properties in Haiti, Santo Domingo, Spain, Porto Rice and the Philippines.

Fred W. Peters was appointed comptroller of the Oklahoma Natural Gas Corporation. Mr. Peters has been placed in charge of all accounting, reparation of budgets, all statistical matter, tax reports and similar matters.

Mr. Peters was for five years associated with Peoples Light and Power Corporation in New York in the capacity of comptroller, and joined Oklahoma Natural last February. From 1916 to 1925, he was a member of the accounting staff of Arthur Young and Company, Certified Public Accountants of Chicago, where duties brought him in contact with many public utilities of the country in connection with accounting, operating, and financing problems. Through this association, Peters acquired a diversified knowledge of practically all public service enterprises, including natural gas, manufactured gas, water and electric light and power properties.

Other appointments announced by the Oklahoma Natural Gas Corporation are:

W. K. Cottrell has been named treasurer of the corporation and will have charge of all funds, supervision of all purchases and insurance.

Mr. Cottrell entered the services of the Oklahoma Natural in 1927 as auditor, and was made treasurer six months later. He moved to Tulsa from Missouri in 1916 to enter the oil business with the Cosden Oil and Gas Company. After leaving the Cosden organization he was auditor for the Iron Mountain Oil Company, and for several years was comptroller of 16 companies of Tidal-Tidewater Oil affiliations in Oklahoma. Cottrell served on the general committee of the American Petroleum Institute in formulating the uniform classification of accounts for the oil industry; served on the committee appointed by the Oklahoma Corporation Commission formulating the uniform classification of accounts for the Oklahoma public utilities and is now a member of the general accounting committee of the American Gas Association.

W. Jennings Young is now general sales manager of the Oklahoma Natural Gas Corporation.

Mr. Young is a graduate in metallurgical engineering from Pennsylvania State college, his native state, and his early positions were in Pennsylvania steel mills in connection with distribution of gas; 18 months in the artillery branch of the army, and one year with Municipal Engineering Corporation of Butler, his home town. He joined Ok-

lahoma Natural in 1920 and immediately launched upon a succession of varied tasks. In turn he collected bills, acted turn-on and turn-off man, trouble shooter, service boss, domestic control clerk, commercial drilling gas and gas measurement departments employee, meter repair man, supervisor of meters and measurement western division, assistant to vice-president of operations and finally general sales manager.

Reid S. McBeth has been made assistant to President E. A. Olsen. Formerly directing head of public relations, Mr. McBeth in addition assumes all duties incident to that of assistant to the president and in the handling of executive routine.

McBeth, a native of Indiana and graduate of Purdue University, joined the Oklahoma Natural in December, 1924, as director of public relations. He moved to Tulsa in 1919 from New York to become advertising manager of the old Oklahoma Producing and Refining Corporation, after having been a newspaper writer and editor in Terre Haute, Indianapolis, Little Rock, Ark., and New York. In 1921 he became associate editor of Oil and Gas Journal, handled publicity and advertising for the first two International Petroleum Expositions, spent some time as a news writer for the Tulsa World from where he went to Oklahoma Natural.

Harry Robinson succeeds Mr. Harris as superintendent of the Englewood, N. J., district of the Public Service Electric & Gas Corporation. Mr. Robinson had been superintendent of the Pompton district. Mr. Roger Damon, who was assistant superintendent at Pompton, becomes superintendent of that district.

E. L. Weeks, assistant to the superintendent of manufacture, Paterson, N. J., district of the Public Service Electric & Gas Company, was recently appointed superintendent of manufacture, succeeding William J. Harvey, who was transferred to the Newark office of the company.

Walter H. Sammis was recently appointed vice-president of Consumers Power Company and elected to its board of directors. Mr. Sammis has been associated with the Consumers Power Company since 1920.

J. D. Polite was recently placed in charge of both the Havre de Grace, Md., Gas Company and the Elkton Gas Company, Elkton, Md.

W. J. Lynch has been appointed manager of the Virginia Gas and Utilities Company's properties at Pulaski and East Radford, Va.

John W. McCardle, chairman of the Indiana Public Service Commission, will retire when his present term of office expires May 1, next year, he has announced. On that date the commission head will have completed four terms on the commission totaling sixteen years, most of which he was the presiding officer.

Before becoming a member of the commission, he was a member of the state board of tax commissioners, being appointed to that position upon the election of the late Gov. J. F. Hanly, whose campaign he managed. He was appointed a member of the Public Service Commission by former Governor James P. Goodrich, and reappointed by Governors McCray, Jackson and Leslie. In declaring that he will not be a candidate for reappointment, he said he is going back to the farm. He is the owner of several farms but plans to retain his home in Indianapolis.

George S. Campbell was appointed Manager of the Pasadena District of the Los Angeles Gas & Electric Company. In this capacity Mr. Campbell will take over the duties formerly handled by James F. Tickner, who retired from active service, and in addition, Mr. Campbell will continue in charge of gas distribution activities for the company in both the Pasadena and Alhambra districts.

Mr. Campbell's connection with the company dates back to December, 1903, when he was first employed as a helper. Advancing successively through the positions of gas fitter, meterman, assistant foreman and foreman, he has been, since March, 1927, assistant superintendent Gas Distribution, in charge of the Pasadena-Alhambra District.

Joseph B. Myers recently resigned as Sales Manager of The Philadelphia Gas Works Company, Philadelphia, Pa., after almost thirty-three years of service. Mr. Myers first entered the employ of The Philadelphia Gas Works as a clerk in the Commercial Agent's Department in 1899.

Obituary

O. N. GULDIN

Olaf N. Guldin, 83 years old, nationally-known gas engineer and for 30 years president of the Western Gas Construction Company, Fort Wayne, Ind., died at his home there after a long illness. A native of Norway, Mr. Guldin settled in Fort Wayne in 1884 and since that time has been a factor in the development of the city and its industries. He is survived by the widow and three sisters. He graduated from a technical school at Bergen, Norway, after preparatory schooling at Christiania. Following a year of special studies at Munchen, Bavaria, and a year of training in the A. L. Thune iron works, he came to the United States to accept a position with the Baldwin Locomotive Works.

Later he worked for a prominent gas engineer at Lancaster, Pa., and then went to Fort Wayne at the instance of A. D. Cressler whom he met at a convention of the American Gas Light Association. He became engineer of the Kerr-Murray Manufacturing Company and later joined with W. A. Croxton and Frank D. Moses in opening an office of consulting gas engineers which later developed into the Western Gas Construction Company. Later the firm was incorporated under its present name.

Mr. Guldin held memberships in many gas organizations. He also was a member of the Elks and Masonic lodges.

Wisconsin Public Service Corp. Awarded Safety Trophy

For the third time in four years, Wisconsin Public Service Corporation, a subsidiary of Standard Gas and Electric Company, has received the highest award of the National Safety Council for safe operation and prevention of accidents to employes, in the combined gas and electric group having 500 or more employes. The official presentation of the safety trophy was made recently at the National Safety Congress at Washington, D. C., to C. B. Boulet, representing the company. Similar trophies were awarded this company in 1929 and in 1930.

Duquesne Light Company, another subsidiary of Standard Gas and Electric Company, won third place in the National Safety Council contest in the electric group having 500 or more employes. Last year and the year before, this company won first honors in this classification.

The contest covered the twelve month period from July 1, 1931, to July 1, 1932, and the awards were granted on the basis of the fewest accidents per million man hours worked.

Wisconsin Public Service Corporation during this period had but three lost time accidents and established the extremely low frequency of 1.070, slightly over one accident for each million man hours of active employment. Duquesne Light Company's third place honors came as a result of establishing a lost time accident rate of 3.24 as against the winning company's rate in its classification of 2.69. The national average frequency rate for all public utilities reporting to the National Safety Council for the year 1931 was 11.30 accidents per million man hours worked.

Oklahoma Gas and Electric Company, another Standard Gas and Electric Company subsidiary, won first place in two divisions of the National Fleet Contest, awards for which were also presented at the National Safety Congress.

Answer to Starbuck's Rebus:
"Adequate equipment and not good intentions keeps the plant running."

Byllesby Engineering

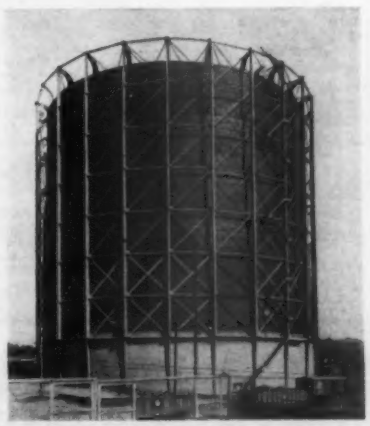
and Management Corporation

Wholly-owned subsidiary of

Standard Gas and Electric Company

231 South La Salle Street, Chicago

New York Pittsburgh San Francisco



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It is the cheapest, most efficient, durable, simple, fully automatic, positively safe, COMPLETE Conversion Burner offered today. Furnished with a high grade Pilot Light, accurate snap-action Thermostat, a sturdy relay and a patented Draft Hood which improves both burner and furnace at least 10%.

It lists at $107.50 complete, with your regular Trade Discount allowed. This size takes care of from 50 to 150 cubic feet of Natural Gas per hour. Larger sizes furnished at small increase in price.

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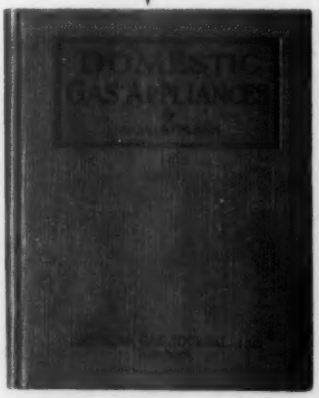

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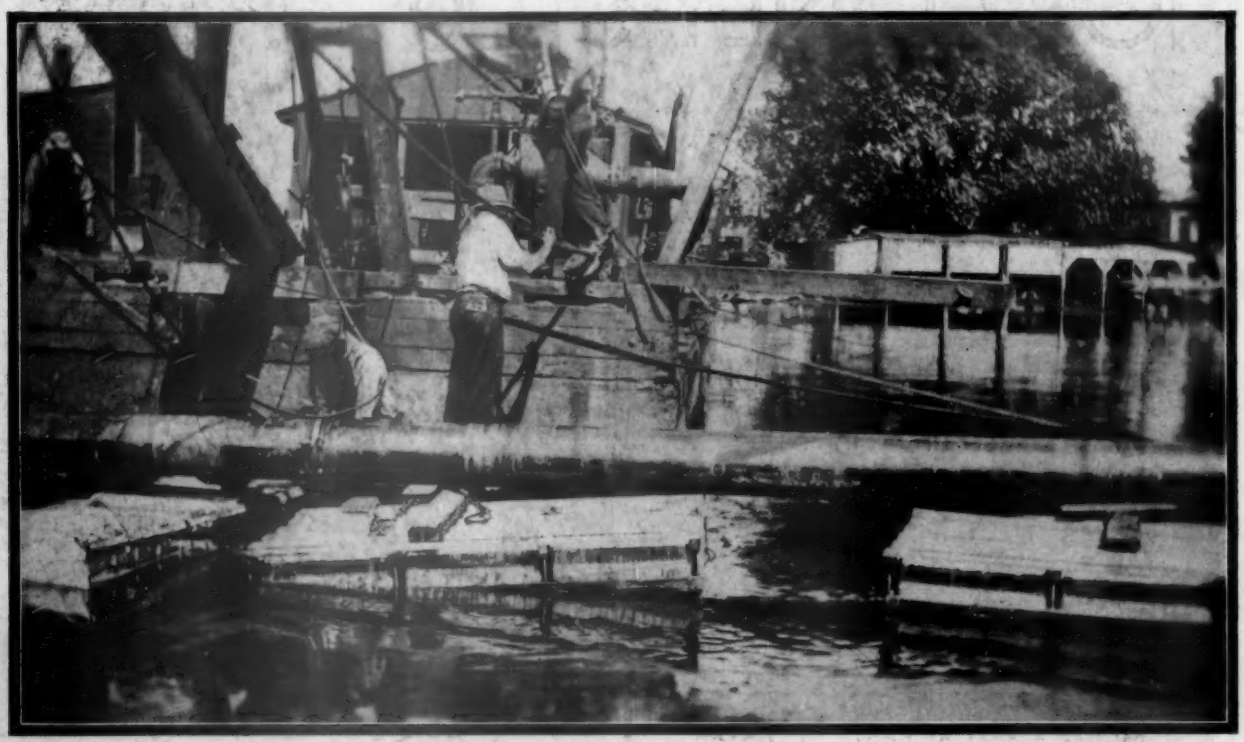

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